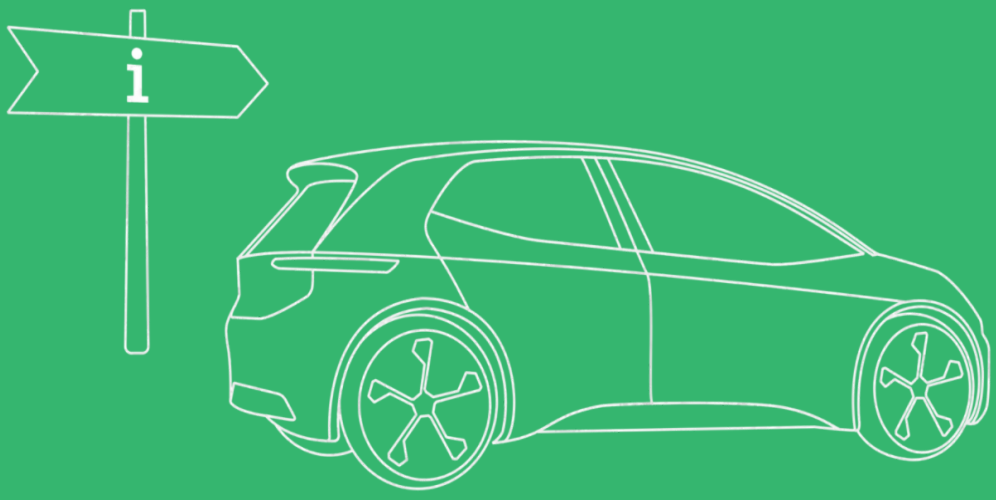
Appendices



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The future of corporate car sharing

Creating an innovation strategy for Greenwheels

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Appendix A: Price comparison

The direct competitors were categorised based on the pricing model, type of car sharing system, target group and price level (see figure 1). The price was calculated based on a 2-hour trip with a travel distance of 100 kilometres. In case a company charges a monthly subscription fee, it was assumed that the employee made four trips a month. As a comparison, this trip would costs €35,45, while using Greenwheels Business Regular subscription.

	Pricing model	Type of system	Target group	Price for 2 hours and 100km
AMBER	Pay-per-minute	Hub based	Corporate	€ 30.00
AlphaCity	Pay for usage	Station based	Corporate	Unknown
ATHLON	Pay for usage or fixed fees	Station based	Corporate	Unknown
wisselwagen	Subscription + distance fee	Station based	Corporate	Unknown
LeasePlan	Leasing costs + Fixed service fee	Station based and hub based	Corporate	Unknown
WE DRIVE SOLAR	Subscription + distance fee	Station based	Corporate & consumers	€ 40.25*
stapp.in	Subscription + hourly rate + distance fee	Station based	Corporate & consumers	€ 33.93*
mywheels	Price per day + distance fee	Peer-to-Peer	Corporate & consumers	€ 33.30**
Juuve	Hourly rate + distance fee	Station based	Corporate & consumers	€ 24.00

* : Based on 4 trips / month ** : Based on gasoline consumption of 1L/12km and price of €1.60 per litre.

Figure 1: Overview of direct competitors.

As the overview shows, most direct competitors use a station-based car sharing system. They calculate their prices based on a combination of travel distance and a subscription fee or an hourly fee. Greenwheels is positioned slightly above the average price, even tough the difference is small. The larger leasing companies (AlphaCity, Athlon, LeasePlan) were less transparent about their pricing strategy and regarded this information as confidential, therefore the prices of these competitors could not be estimated.

Appendix B: Organisational buyer behaviour

Usually, the buyer and user of a product are the same person. However, since Greenwheels offers their CCS service to organisations instead of consumers the buying context is different. Therefore, it is important to analyse the search, evaluation and purchase processes within a B2B sales setting.

In this section, several theories will be reviewed in order to get an understanding of organisational buyer behaviour. This review is based on the Business Marketing book by Dwyer & Tanner (2009). The theories that will be explored in this chapter are: Buying determinants theory, Role theory and Individual buyer theory.

Buying determinants theory

The buying determinants theory is a general theory which describes the process of organisational buying as the combined result of four different factors (see figure 2). These factors are: (1) environmental factors, (2) market factors, (3) organisational factors and (4) individual factors.

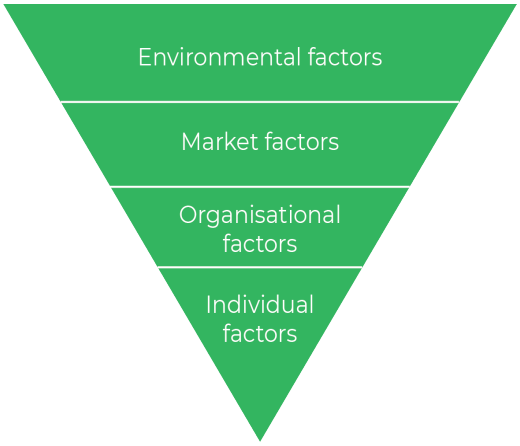


Figure 2: Buying Determinants Theory. Based on Dwyer & Tanner (2009).

Environmental factors

Environmental factors are made up of all the factors beyond the borders of the market world, such as economy, technology, political and social factors. A wide variety of these environmental factors were identified for the domain of this project during the trend analysis (see Chapter 8). The complete list of environmental factors can be found in Appendix D.

Market factors

Market factors are the characteristics of the market which influence buyer behaviour. These factors include the size and number of competitors and the number and size of the customers in a specific market. The number of competitors is also strongly influenced by the availability of substitute products.

Organisational factors

These factors are company specific. Factors include size of the company, profitability, organisational structure, corporate experience, distribution of power and organisational policies. These factors can be used to segment the market and to choose one specific group of companies to focus the marketing efforts on. The evaluation of different customer segments can be found in Chapter 6.

Individual factors

Individual factors are made up of demographic and psychological factors. These factors include age, education and organisational level of the buyer. It is important to take these individual factors into account, since the decision maker might not always seek to maximise benefits for the organisation but could also try to maximise personal benefits instead.

Therefore, the individual factors of relevant stakeholders were identified using customer profiling (see Chapter 7).

Role theory
A more specific theory for understanding organisational buying behaviour is role theory.

Role theory suggests that people use a set of norms and expectations to guide their behaviour. When one person is responsible for making the purchase decision of an organisation the decision is regarded as autonomous. More often, however, multiple people are involved with the purchasing decision, making the process increasingly complex. Role theory helps to understand how these different stakeholders interact with each other within such groups. The group of stakeholders involved in the purchasing process is called the decision-making unit (DMU).

Sometimes, DMUs occur because of organisational policy (e.g. governmental purchasing policies). In other situations, DMUs occur when multiple areas within the organisation are affected by the decision or when the amount of risk associated with the purchase is high.

Dwyer & Tanner (2009) identified several groups of stakeholders within DMUs: initiators, decision makers, controllers, purchasing agents, influencers and gatekeepers. In some cases, the roles within the buying process are appointed formally to establish an official "buying committee". However, more often the composition of the group changes over time and is formed informally.

Initiators are the ones who start the purchase process by recognizing the need for the purchase.

Decision makers are the ones who makes the final call on the purchasing decision.

The controller is a person who sets and controls the yearly budget for the organisation.

Purchasing agents are employees who perform the actual purchase action. Often, these people just fulfil the purchase task given to them by their superior. Therefore, purchasing agents can be anyone within the organisation.

Influencers are individuals who want to affect the decision maker's final decision by recommending specific vendors, products or services. In some cases, end-users are part of this group of stakeholders.

The final group of stakeholders are called gatekeepers. They control the information flows between the different groups. Because of this control, they are able to influence the decision-making process by being selective in what information they pass along to others.

To describe the factors influencing the DMU, multiple dimensions can be used. These dimensions are: time dimensions, formalisation dimensions, vertical dimensions and horizontal dimensions.

Time dimensions
Time fragmentation refers to the degree that members come and go within the DMU. It is important to understand time fragmentation in order to distribute the amount of resources according to the time those people spend in the purchasing team.
For example, investing a lot of time on personal selling to an individual who leaves the DMU the next week is not worthwhile.

Another important factor is the overall project timespan. As a supplier, the decision time should be as low as possible, in order to improve sales performance.

In general, decision making time is longer when buying centres are large, or if their members are inexperienced. Longer decision time benefits non-established buyers, while shorter decision times favours suppliers with an established relationship with the customer.

Vertical dimensions
Vertical dimensions refer to the number of management layers that are involved in the buying process. Vertical dimensions alone are usually not a problem, since these people often use the same media, attend the same trade shows and read the same publications. The real challenge for a sales person is to uncover who the decision maker is within the DMU.

Horizontal dimensions
Horizontal dimensions refer to how many departments are involved in the purchase decision. Combined with the vertical dimensions, they give an indication of how many people are involved in the project. In general, it is easier to sell to a narrow organisation than to a wider organisation, since less people have to be convinced and decision time is shorter.

Formalization dimensions
This dimension relates to the degree to which purchasing roles and tasks are defined by written documents. Formalisation is only used to influence the initiation and selection stages of the buying process, while it has relatively little effect on the other stages. However, formalisation can lead to unproductive measures, such as following a strict bidding policy, even though the supplier has already been selected informally.

Risks
Another important factor influencing the behaviour of DMUs is risk. As stated before, DMUs are often focussed on minimising risks such as financial, performance or social risks. Sellers can reduce the perception of risk by offering guarantees, warranties, free trials and by giving demonstrations of the product or service.

Individual buyer theory

Role theory helps to understand which roles individuals in the DMU take on, however, the personal differences between these individuals is not accounted for in these theories. In order to explain these personal differences, individual buyer theory was developed.

Individual buyer theory focuses on how an individual will buy something instead of focussing on what will be bought. In order to determine what tasks will be performed, buyers go through a series of steps (see figure 3).

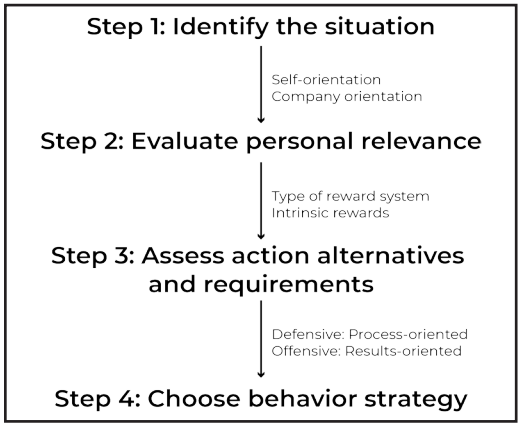


Figure 3: Behaviour Choice Model. Source: Dwyer & Tanner (2009).

The first step is determining the situation. Someone could work to achieve personal benefits, while it is also possible that someone works to achieve benefits for the company. The next step is evaluating personal relevance. Here, the buyer examines which reward structures are in place, for both extrinsic and intrinsic rewards. During the third step, the buyer checks for alternatives and if buying requirements are applicable. The final step is the selection of a buying strategy. There are two possible strategies: offensive strategies (maximising gains) and defensive strategies (minimising risk).

Key findings

Buying determinants theory gives a clear overview of the types of factors influencing a B2B purchasing decision, most of which were already covered in the Discover Phase.

Role Theory describes the stakeholder roles within the purchasing process and provides a number of suggestions for increasing sales performance. Using this theory, the following suggestions were identified:

- Identify who is the decision maker within a DMU as quickly as possible.

- Allocate time and resources according to the degree of influence, and the amount of time someone spends within a DMU.

- Keeping decision time as low as possible is favourable for suppliers such as Greenwheels.

- It is favourable to focus on selling to narrow structured organisations rather than wide organisations.

- Perceptions of risk can be reduced by leveraging Greenwheels' years of experience in the car sharing industry.

- Providing potential buyers with free trials and demonstrations will lower perceived risks as well.

Individual buyer theory stresses the importance of identifying to what degree stakeholders are interested in achieving personal benefits or company benefits. Therefore, the personal incentives for the different stakeholder groups will have to be identified.

Appendix C: Interviews

Overview of participants


Louis van der Hoeven - Project manager (Stedin)


Jelle Oosterhoff - Business Mobility Consultant (Pon)


Marjolein Peters - Facility manager (Stichting Vluchteling-Studenten UAF)


Gertjan Sybrandi - Mobility manager (Stedin)


Matthijs Boon - Business developer (Next Urban Mobility)


Marijk van der Hoek - Strategic Advisor HR (Gemeente Meierijstad)


Wouter Oldenburger - Project manager (MIND mobility/Pon)

General interview guide

Introductie
Het onderzoek wat ik aan het doen ben is in het kader van mijn afstudeerproject voor mijn studie aan de TU Delft. Hiervoor werk ik samen met Greenwheels. Het doel van deze interviews is om de context van de (zakelijke) autodeel in Nederland markt in kaart te brengen voor het jaar 2025. Aan de hand van deze nieuwe context zal ik kijken hoe Greenwheels zich het beste kan positioneren in de markt.

Vind je het goed als dit gesprek wordt opgenomen?

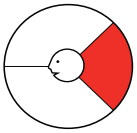
Heb je nog vragen vooraf?

Pay attention to:
- Stel (korte) open vragen zonder voorbeelden
- Laat vaak stiltes vallen
- Op zoek naar objectieve beschrijvingen, niet iemands morele oordeel of standpunt.
- Vraag niet alleen hoe iets is maar vooral waarom.
- Hou je niet te streng aan het script maar blijf vooral doorgaan op punten die geïnterviewde interessant vindt

Interview transcripts and lists of questions have been redacted for confidentiality purposes. For more information contact the author of this thesis.

Customer Jobs

Trigger Questions



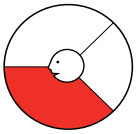
Jobs describe the things your customers are trying to get done in their work or in their life. A customer job could be the tasks they are trying to perform and complete, the problems they are trying to solve, or the needs they are trying to satisfy.

Use the following trigger questions to help you think of different potential customer jobs:

1. What is the one thing that your customer couldn't live without accomplishing? What are the stepping stones that could help your customer achieve this key job?
2. What are the different contexts that your customers might be in? How do their activities and goals change depending on these different contexts?
3. What does your customer need to accomplish that involves interaction with others?
4. What tasks are your customers trying to perform in their work or personal life? What functional problems are your customers trying to solve?
5. Are there problems that you think customers have that they may not even be aware of?
6. What emotional needs are your customers trying to satisfy? What jobs, if completed, would give the user a sense of self-satisfaction?
7. How does your customer want to be perceived by others? What can your customer do to help themselves be perceived this way?
8. How does your customer want to feel? What does your customer need to do to feel this way?
9. Track your customer's interaction with a product or service throughout its lifespan. What supporting jobs surface throughout this life cycle? Does the user switch roles throughout this process?

Customer Pains

Trigger Questions



Pains describe anything that annoys your customers before, during, and after trying to get a job done or simply prevents them from getting a job done. Pains also describe risks, that is, potential bad outcomes, related to getting a job done badly or not at all.

Use the following trigger questions to help you think of different potential customer pains:

1. How do your customers define too costly? Takes a lot of time, costs too much money, or requires substantial efforts?

2. What makes your customers feel bad? What are their frustrations, annoyances, or things that give them a headache?

3. How are current value propositions under performing for your customers? Which features are they missing? Are there performance issues that annoy them or malfunctions they cite?

4. What are the main difficulties and challenges your customers encounter? Do they understand how things work, have difficulties getting certain things done, or resist particular jobs for specific reasons?

5. What negative social consequences do your customers encounter or fear? Are they afraid of a loss of face, power, trust, or status?

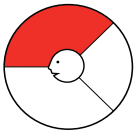
6. What risks do your customers fear? Are they afraid of financial, social, or technical risks, or are they asking themselves what could go wrong?

7. What's keeping your customers awake at night? What are their big issues, concerns, and worries?

8. What common mistakes do your customers make? Are they using a solution the wrong way?

9. What barriers are keeping your customers from adopting a value proposition? Are there upfront investment costs, a steep learning curve, or other obstacles preventing adoption?

Customer Gains



Trigger Questions

Gains describe the outcomes and benefits your customers want. Some gains are required, expected, or desired by customers, and some would surprise them. Gains include functional utility, social gains, positive emotions, and cost savings.

Use the following trigger questions to help you think of different potential customer gains:

1. Which savings would make your customers happy? Which savings in terms of time, money, and effort would they value?
2. What quality levels do they expect, and what would they wish for more or less of?
3. How do current value propositions delight your customers? Which specific features do they enjoy? What performance and quality do they expect?
4. What would make your customers' jobs or lives easier? Could there be a flatter learning curve, more services, or lower costs of ownership?
5. What positive social consequences do your customers desire? What makes them look good? What increases their power or their status?
6. What are customers looking for most? Are they searching for good design, guarantees, specific or more features?
7. What do customers dream about? What do they aspire to achieve, or what would be a big relief to them?
8. How do your customers measure success and failure? How do they gauge performance or cost?
9. What would increase your customers' likelihood of adopting a value proposition? Do they desire lower cost, less investment, lower risk, or better quality?

Appendix D: ViP method

During the first two phases of the graduation project (Discover and Define), the Vision in Product design (ViP) method (Hekkert & van Dijk, 2011) was used to develop a future vision statement. The ViP method was adapted to make it compatible with this particular project. The adapted ViP method consists of two phases: understanding and designing. These two phases will now be explained in more detail.

Understanding phase
The first phase of the adapted ViP process is the understanding phase. The goal of this phase is to understand the current car sharing service, by posing the question "Why is it designed the way it is?". This question was answered by analysing literature, the company, the service and the business context. These analyses were performed using a variety of research methods, since a holistic understanding of the current and future context can only be achieved by combining multiple approaches together. The outcomes of these analyses can be found in the main report.

Designing phase
During the second phase of the process, a future vision statement was created. First, the domain and scope of the project were determined in order to define the boundaries of the project. This process will be explained in the next paragraph. Next, context factors, also known as the "building-blocks" for the future context, were generated and clustered. Together, the clusters of context factors formed a framework of the future world. Based on this framework, a vision statement was formulated which distilled the essence of the future context into one sentence.

Domain and scope of the project
Within this section the domain an scope of the design project are defined. A domain indicates the boundaries of the design project, while the scope of the project determines its time frame. Usually, designers want the domain to be as abstract as possible, in order to have the creative freedom to develop something in line with their own vision. However, most clients have a concrete issue they want to see solved. Therefore, the project domain has to be specified according to the MAYA principle, which stands for "Most Abstract, Yet Acceptable".

The first project domain offered by the company was defined as "Determining the mobility needs of potential corporate clients". More specifically, the company requested a tool which would help them gain insight into the mobility needs of potential corporate customers. The underlying reason for developing this tool was that the company wanted to grow the CCS division over the coming years by helping clients understand their own mobility needs.

This initial domain felt a bit too restrictive, since the formulation of the domain showed that the company already had a solution in mind (a tool for mapping client needs). Therefore, the domain was redefined more loosely as: "Sustainable corporate mobility". This new domain was sufficiently abstract to facilitate a strategic design project. The word "sustainable" was purposely added to the domain. On the one hand, because it was my personal goal to design something that would stimulate sustainable consumption. On the other hand, I wanted to design something that would provide the client with a sustainable advantage over their competitors in the corporate mobility market.

After reviewing this new domain with the company, it was decided that it had become too abstract in order to be practical, given the limited time and resources of this project. The company indicated that it wants to fulfil a supplier role in the mobility market of the future, without offering different types of transportation. In other words, Greenwheels wants to focus on car sharing without becoming a MaaS provider themselves.

Additionally, it was decided that the project should only focus only on the Netherlands, since every country has a very specific mobility context. Therefore, the domain was redefined once more as: “Sustainable corporate car sharing in the Netherlands”. The domain iterations are shown below (see figure 4).

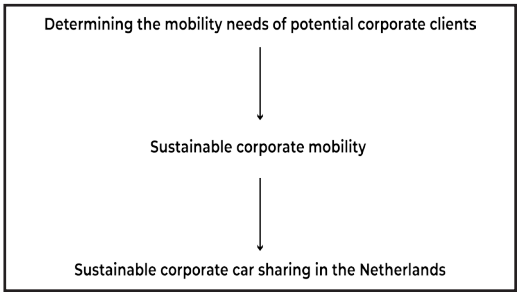


Figure 4: Domain iterations.

Next to a clearly formulated domain, the project needed a scope. It was decided that the context of this project will be limited to the year 2025. This time frame of six years into the future was chosen in order to strike a balance between what the client company was familiar with, and the long-term perspective inherent to strategic design.

The company was used to making strategic roadmaps for up to three years into the future. The relatively short time frame of these roadmaps is a consequence of the complexity and rapidly changing nature of the mobility sector. Nonetheless, this design project aims to look beyond this timeframe of three years and to provide the company with a clear vision of the corporate car sharing world of 2025. Therefore, the domain and scope of this design project were defined as:

“Sustainable corporate car sharing in the Netherlands in 2025”.

- Domain & Scope of the project

Context factors

This list contains all context factors divided over the following categories: demographic, economic, sociological and cultural, environmental, psychological, technological and political.

Demographic

Graying population: The percentage of seniors is increasing in the Netherlands (NiDi, 2018). Development

The total population in the Netherlands is increasing (Heilbron, 2018). Development

Urbanisation: More and more people are moving from rural areas to the big cities (CBS, 2016). Development

Households are getting smaller: The average household size is decreasing (CLO, 2014). Development

People are getting older: The average life expectancy is increasing in the Netherlands (CBS, 2018). Development

Especially young people are more interested in sharing a car compared to older people (ING Economics Department, 2018). State

Increasing amount of people having a driving license (CBS StatLine, 2018c). Development

People get their driving license at an increasingly younger age (CBS, 2018f). Trend

Inexperienced drivers are more likely to cause accidents (SWOV, 2016). Principle

Elderly people make up for an increasing percentage of car owners (CBS, 2018h). Development

Car sharing is an urban phenomenon: Young people living in cities are half as likely to own car compared to young people in rural areas (CBS, 2018g). Trend

Economic

Platforms rule the world: Online transportation platforms such as Uber and Lyft are rapidly gaining market shares worldwide. Development

Wealth gap is growing: Wealth inequality in the Netherlands is one of the highest from all developed countries (Rietman, 2018). Development

Globalisation: Organisations are increasingly operating in multiple countries. Development

Inner cities are becoming only accessible for the rich. Housing prices are rapidly increasing in urban areas due to shortages on the housing market (CBS, 2018c). Development

Access over ownership: An increasing group of people only want to buy the performance of a product and no longer want to own the product itself (Botsman & Rogers, 2010). Trend

The gig economy: The amount of flexible, short-term jobs will increase and the number of permanent employment will decrease (Haarsma, 2018). Development

The Netherlands has the most part time workers in the EU (CBS, 2009). State

Electric cars are becoming affordable: The price of electric cars are dropping rapidly due to lower prices of batteries (De Ingenieur, 2015). Development

Car manufacturers are increasingly experimenting with new business

models (Autodelen.info, 2018). Development

Automation and artificial intelligence increasingly replaces low skilled jobs (Joblift, 2018). Development

Increasing amount of competition in the car sharing market due to new entrants (CROW, 2018). Development

The labour market is becoming increasingly flexible: More and more people are working as freelancers (CBS, 2018d). Development

Increasing spendable income amongst Dutch households since 2014 (CBS, 2017). Development

Amount of start-up companies is increasing in the Netherlands (CBS, 2018e). Development

Mobility is becoming more flexible: Private lease contracts, car sharing and personal mobility budgets are growing rapidly (Straatman, 2016). Development

Companies are reforming mobility policies and HR/benefits policies. Development

Sociological and cultural

Ethical consumers: People are becoming increasingly aware of the impact of their consumption on the world (Shaw, 2002). Trend

The world is getting smaller: Due to the internet and lower travel costs, people are more connected to the rest of the world than ever before. Development

Home and work life are getting increasingly integrated due to technological advancements (Berkouwer, 2018). Trend

People live inside their own online information bubble. Algorithms determine what you see based on your previous searches, therefore people keep seeing the same information online (Technopedia, n.d.). Trend

Online lives matter: Increasing social media usage in order to stay connected with other people (CBS StatLine, 2017). Trend

People want increasingly personalised products and services (Deloitte, 2015). Development

People travel longer distances: increasing transportation needs per person. Development

Home is the new office: An increasing amount of people are working from home in the Netherlands (De Waard, 2018). Trend

Cities are getting clogged: increasing amount of congestion and traffic jams in and around urban areas (ANWB, 2018; Ritzen, 2018). Development

Car sharing is context based: Life changes such as having kids influence the need for a (shared) car. State

Increasing renewable energy production in the Netherlands (Ministerie van economische zaken en klimaat, 2017). Development

Environmental

Emission scandals: Automotive industry is closely being watched by society in regards to environmental regulations (e.g. Sedee, 2017). Trend

Climate change increases extreme weather conditions around the world. Development

Particulate matter pollution in inner cities causes health problems for citizens (Carrington, 2018; Kampa & Kastanas, 2008). Development

Increasing temperatures worldwide due to climate change (NASA, 2018). Development

Governments and companies increasingly want to have a “green” image as supported by the legitimacy theory. Development

Psychological

Products will wear down, but memories last forever. Experiences improve happiness, while owning expensive products doesn’t necessarily (De Bruin, 2016). Principle

The more choices someone has, the harder it is to make a choice. Principle
Experience over functionality: Functional products aren’t enough anymore, people want to have a memorable experience. Trend

People enjoy driving their car and want to keep doing so in the future. State

People experience their car as a private space. They program their favourite radio stations, adjust their seat settings and store personal items. State

People are resistant towards change and stick to what they are used to doing. Principle

People are more careful with their own car compared to a rented or leased car. State

Financial incentives are effective motivators for changing people's behaviour. Principle

People feel like having their own car gives them security. Their car will always be available and they know where it is parked. State

People are often forgetful and need to be reminded of their appointments. Principle

People crave social recognition. It is essential for employees to recognize each other for their contributions in order to stimulate a productive work environment. Principle

Instant results: People are becoming more impatient and want immediate gratification of their needs. Development

A company’s mobility policy is sometimes a decisive factor for choosing one job over the other. State

A car is often seen as a status symbol and an expression of identity (Verdouw, 2015). State

Company policy changes need to go gradual in order for employees to adopt them. State

People want services to be as intuitive as possible due to shorter attention spans. Trend

Changes in Personal HR/benefit arrangements (e.g. personal lease car) are difficult to achieve and are difficult to accept by employees. State

Technological

Autonomous vehicles: Self driving cars are becoming a reality. While driver assistance technology is already available, it is expected that fully autonomous vehicles will become available around 2035-2040. Development

New blockchain applications: An increasing amount of new start-ups are being launched supported by the blockchain technology. Development

The range of electric cars is increasing rapidly (Lambert, 2017). Development

An increasing amount of car and travel data is gathered by car dealerships and car manufacturers using connected cars (Fleet & Mobility, 2018). Development

Increasing amount of charging points for electric cars (Living Lab Smart Charging, 2018). Dutch government aims for 1.8 million charging points for electric vehicles by 2030. Development

Wireless charging for electric cars is becoming a reality (Hurst, 2018). Development

Internet of Things (IoT): Products are getting increasingly connected with each other. Development

Mobility hubs: Hubs offering different means of transportation will grow the coming years. Development

Mobile applications support the rise of car sharing (Cox, 2010). Development

Mobility as a Service (MaaS) platforms are rising: MaaS platforms offer multiple means of transportation through one user interface and are expected to grow rapidly over the coming years (Hietanen, 2014). Development

Smart charging: Technology for managing the energy offer and the energy demand for charging electric vehicles is being developed in smart way to bring together supply and demand. Development

Organisations are increasingly migrating their local data to cloud storage solutions. Development

Software features are increasingly important for car sales (Volkswagen, 2018). Development

Political

It is becoming impossible to own a car in the city: Increased parking prices in larger Dutch cities force people to get rid of their car (e.g. Gemeente Amsterdam, 2019). Development

Dutch government is increasing road taxes for cars with combustion engines over the coming years (AutoRAI, 2017). Development

European emission regulations are getting stricter for new cars (DuurzaamBredijfsleven, 2014). Development

Increasing amount of people are calling for a road tax reform that would tax usage instead of a fixed fee (Rottier, 2019; Hofs, 2018). Trend

Subsidies for purchasing electric vehicles are made available by the Dutch government from 2021 until 2030 (NOS, 2018). Development

Purchase taxes (BPM) on new cars are increasing for non-electric cars (Verkeersnet, 2019). Development

Cities are banning older cars with combustion engines (ANWB, 2019). Development

Privacy legislation inhibits the application of new technologies, such as the connected car (Fleet & Mobility, 2018). Development

Dutch government is increasing the taxation on fossil fuels (Blik op nieuws, 2018). Development

Dutch government stimulates using e-bikes to go to work (Pols, 2018). Development

Dutch government enforces 100% electric cars sales by 2030. State

Public and private organisations are increasingly working together to promote car sharing. They signed the “Green deal autodelen” covenant, which aims for 100.000 shared cars and 700.000 users by 2021. Development

Context factor clusters

Responsibility
Governments and companies increasingly want to have a "green" image in order to get social approval. This development is supported by legitimacy theory.

Ethical consumers: People are becoming increasingly aware of the impact of their consumption on the world (Shaw, 2002).

Emission scandals: Automotive industry is closely being watched by society in regards to environmental regulations (e.g. Sedee, 2017).

Public and private organisations work together to promote car sharing. They signed the "Green deal autodelen" which aims for 100.000 shared cars and 700.000 users by 2021.

Companies are reforming mobility policies and HR/benefits policies.

Driving = Emotion
People enjoy driving their car and want to keep doing so in the future.

People feel like having their own car gives them security. Their car will always be available and they know where it is parked.

A car is often seen as a status symbol and an expression of personal identity (Verdouw, 2015).

People are often more careful with their own car compared to a rented or leased car.

Flexibility
Mobility is becoming more flexible: Private lease contracts, car sharing and personal mobility budgets are growing (Straatman, 2016).

The gig economy: The amount of flexible, short-term jobs will increase and the number of permanent employment will decrease (Haarsma, 2018).

The labour market is becoming increasingly flexible: More and more people are working as freelancers (CBS, 2018d).

Mobility as a Service (MaaS) platforms are rising: MaaS platforms offer multiple means of transportation through one user interface and are expected to grow rapidly over the coming years (Hietanen, 2014).

Mobility hubs: Hubs offering different means of transportation will grow the coming years.

Mobile applications support the rise of car sharing (Cox, 2010).

Personalised world
People want increasingly personalised products and services (Deloitte, 2015).

People experience their car as a private space. They program their favourite radio stations, adjust their seat settings and store personal items.

Experience over functionality: Functional products aren't enough anymore, people want to have a memorable experience.

The office is anywhere
Home and work life are getting increasingly integrated due to technological advancements (Berkouwer, 2018).

Globalisation: Organisations are increasingly operating in multiple

countries.

Home is the new office: An increasing amount of people are working from home in the Netherlands (De Waard, 2018).

The world is getting smaller: Due to the internet and lower travel costs, people are more connected to the rest of the world than ever before.

Cities are getting clogged: increasing amount of congestion and traffic jams in and around urban areas (ANWB, 2018; Ritzen, 2018).

Elitist cities
Inner cities are becoming only accessible for the rich. Housing prices are rapidly increasing in urban areas, due to shortages on the housing market (CBS, 2018c).

Automatisation and artificial intelligence increasingly replaces low skilled jobs (Joblift, 2018).

It is becoming impossible to own a car in the city: Increased parking prices in larger Dutch cities force citizens to get rid of their car (e.g. Gemeente Amsterdam, 2019).

Wealth gap is growing: Wealth inequality in the Netherlands is one of the highest from all developed countries (Rietman, 2018).

Cities are banning older cars with combustion engines (ANWB, 2019).

Urbanisation: More and more people are moving from rural areas to the big cities (CBS, 2016).
Seniors make up for an increasing percentage of car owners (CBS, 2018h).

Collaborative Consumption
Access over ownership: An increasing group of people only want to buy the performance of a product and no longer want to own the product itself (Botsman & Rogers, 2010).

Products will wear down, but memories last forever. Experiences improve happiness, while owning expensive products doesn't necessarily (De Bruin, 2016).

Car manufacturers are experimenting with new business models (Autodelen.info, 2018).

Increasing amount of competition in the car sharing market due to new entrants (CROW, 2018).

Platforms rule the world: Online transportation platforms such as Uber and Lyft are rapidly gaining market shares worldwide.

Data is the new gold
An increasing amount of car and travel data is gathered by car dealerships and car manufacturers using connected cars (Fleet & Mobility, 2018).
Autonomous vehicles: Self driving cars are becoming a reality. While driver assistance technology is already available, it is expected that fully autonomous vehicles will become available around 2035-2040.

Internet of Things (IoT): Products are getting increasingly connected with each other.

Electric for all
Electric cars are becoming more affordable: The price of electric cars are dropping rapidly due to lower prices of batteries (De Ingenieur, 2015).

Increasing amount of charging points for electric cars (Living Lab Smart Charging, 2018).

Dutch government aims for 1.8 million charging points for electric vehicles by 2030.

Smart charging: the energy offer and the energy demand for charging electric vehicles can be managed in a smart way to bring together supply and demand.

Wireless charging for electric cars is becoming a reality (Hurst, 2018).

The range of electric cars is increasing rapidly (Lambert, 2017).

Transition management
People are resistant towards change and stick to what they are used to doing. Changes in Personal HR/benefit arrangements (e.g. personal lease car) are difficult to achieve and are difficult to accept by employees.

Financial incentives are effective motivators for changing people's behaviour.

Car ownership is context based: Life changes, such as having kids, influence the need for a (shared) car.

Battle for our attention
People are often forgetful and need to be reminded of their appointments.

People crave social recognition. It is essential for employees to recognize each other for their contributions in order to stimulate a productive work environment.

People want products and services to be as intuitive as possible due to shorter attention spans.

Instant results: People are becoming more impatient and want immediate gratification of their needs.

The more choices someone has, the harder it is to make a choice.

Requirements
Increasing amount of people are calling for a road tax reform that would tax usage instead of a fixed fee (Rottier, 2019; Hofs, 2018).

Subsidies for purchasing electric vehicles will be made available by the Dutch government from 2021 until 2030 (NOS, 2018).

Dutch government will increase taxation on fossil fuels (Blik op nieuws, 2018).

Dutch government is increasing road taxes for cars with combustion engines for the coming years (AutoRAI, 2017).

Purchase taxes (BPM) on new cars are increasing rapidly for non-electric cars (Verkeersnet, 2019).

Company policy changes need to go gradual in order for employees to adopt them.

Dutch government enforces 100% electric cars sales by 2030.

Privacy legislation inhibits the application of new technologies, such as the connected car (Fleet & Mobility, 2018).

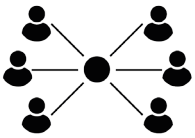
European emission regulations are getting stricter for new cars (DuurzaamBredijfsleven, 2014).

Responsibility

Driving = Emotion

Flexibility

Collaborative consumption



Data is the new gold

Electric for all

Personalised world

The office is anywhere

Elitist cities

Transition management

Battle for out attention

Appendix E: Creative sessions

Two creative sessions were organised in order to generate as many solutions for the design challenges as possible.

Each session involved a different group of participants. One session was organised with end-users, and one with design students. Additionally, a validation session was held with Greenwheels employees in order to evaluate and improve the outcomes of these creative sessions. Beside these group sessions, individual brainstorming took place to elaborate on the outcomes of these sessions.

Both sessions had a slightly different approach and were adapted to the knowledge of the participants. However, both sessions used the method of How-Tos (Tassoul, 2006) in order to split the design challenges up into multiple smaller questions. These How-To questions were problem statements written in the form of questions in order to stimulate the idea generation process. Each creative session will now briefly be discussed.

Session 1: End-users
The first creative session was held at the Ministry of Infrastructure and Water Management in Utrecht. This governmental body is the largest B2B customer of Greenwheels. In total, there were five participants from varying positions within the organisation. Each participant had at least some prior experience with the car sharing service.

The creative session had three goals: First, to come up with a new way of motivating employees to start car sharing. Secondly, to generate ideas for improving the communication between the mobility manager and the end-users. Thirdly, the participants were asked to think of ways to create a feeling of community amongst a group of employees.

In order to guide the generation of ideas, the following How-Tos were formulated:

- How to stimulate behavioural change within an organisation?

- How to facilitate communication between users and the mobility manager?

- How to make employees feel connected to their colleagues?

The creative session started with a brief presentation on Greenwheels and car sharing in general. Afterwards, each participant briefly introduced himself and stated their position within the organisation and briefly explained which experiences they've had with car sharing so far.

After the introduction round, a short introduction on brainstorming was given, highlighting the rules and procedures during the session. Before starting the first idea generation round, a creative warm-up exercise was done. During this warm-up exercise, participants played an adapted version of the well-known game "Pictionary". This warm-up exercise helped the participants forget their regular work, and helped them enter a more creative mindset.

Immediately after the warm-up exercise was finished, three rounds of idea generation took place. Each round addressed one of the previously

stated How-To questions. During these rounds, the participants used brain writing and brain drawing techniques in order to generate as many solutions for the How-To question as possible. Each idea was written down on a Post-it note and placed on a large flip over sheet in front of the group.

When the participants were no longer able to come up with new ideas, they were asked to explain their own ideas to the others. After completing all three brainstorming rounds, the ideas were first grouped on their underlying topic. Additionally, the C-Box method (Tassoul, 2006) was used to cluster the ideas based on innovativeness and feasibility.

Session 2: Design students
The second creative session was organised at the Delft University of Technology and involved three Strategic Product Design students and one alumnus.

The goal of this session was to utilise the designer mindsets of the participants, in order to envision how the design challenges could be solved. The following How-Tos were used during the creative session:

- How to communicate the benefits of car sharing to employees?

- How to learn someone new skills?

- How to create a feeling of community among employees?

The creative session again started with a brief presentation on Greenwheels and car sharing in general. Furthermore, the design challenges were explained and a quick recap of the rules of brainstorming was given.

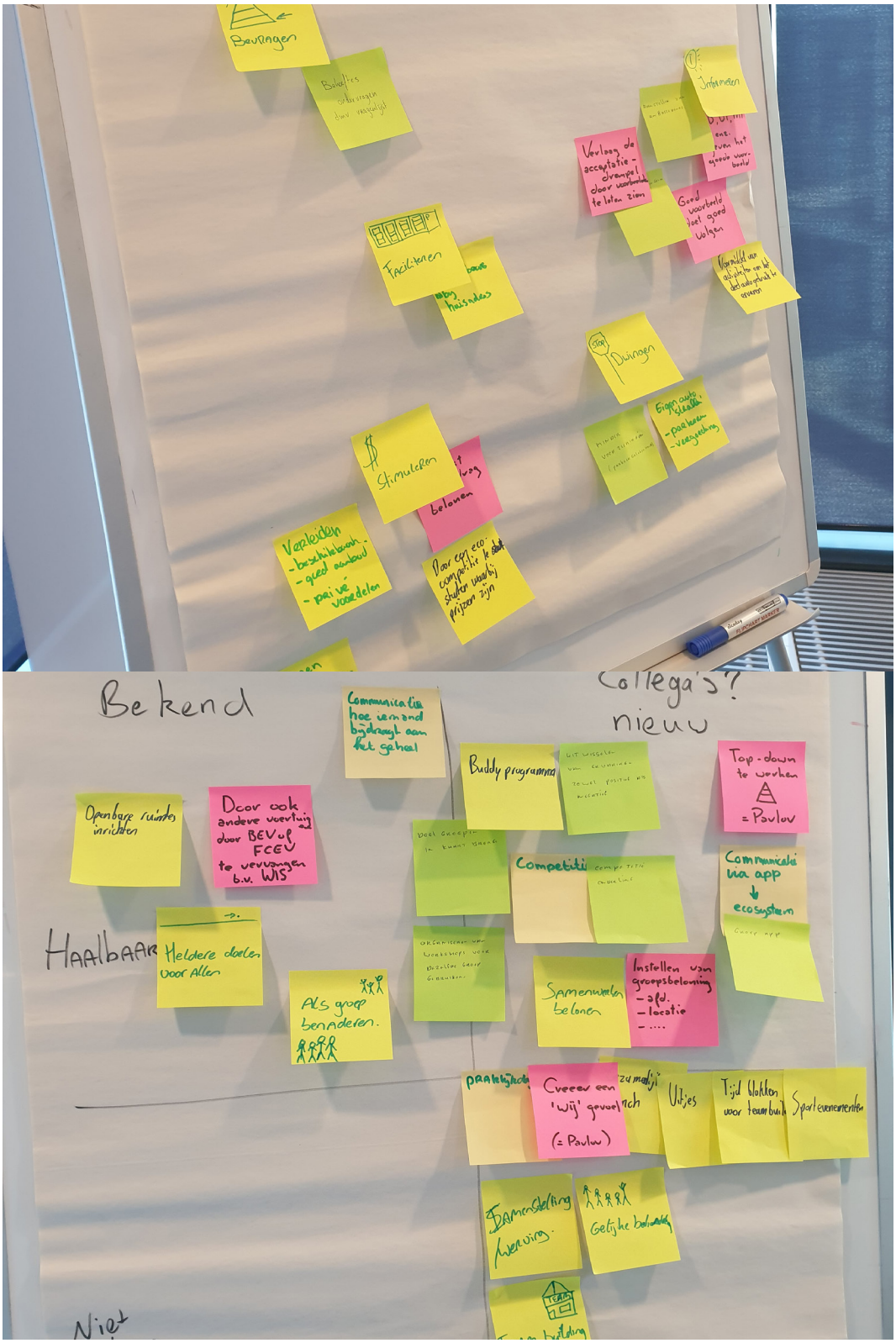
Fortunately, the experience of the participants made it possible to quickly start generating ideas without needing to perform warm-up exercises.

The participants generated ideas and wrote them down on Post-it notes. The notes were placed on a large sheet in the middle of the table so everyone could see them. When the participants were no longer able to generate new ideas, the participants were asked to explain the ideas they had created. While discussing the generated ideas, participants were able to come up with new ideas by iterating on the ideas of others.

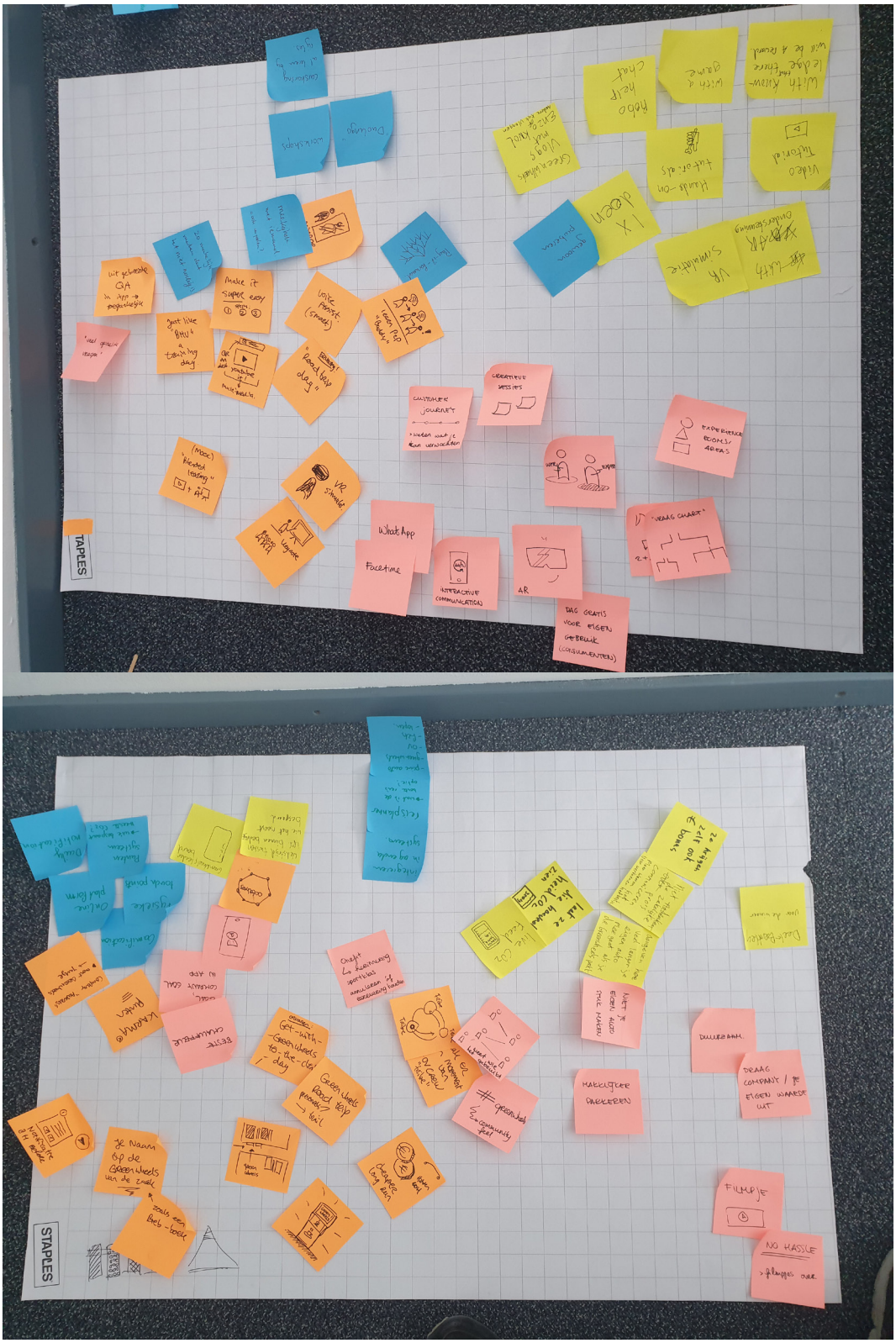
After the three brainstorming rounds were completed, the C-Box method (Tassoul, 2006) was again used to cluster the ideas.

Outcomes
Beside the creative sessions, individual brainstorming took place in order to combine several separate ideas into multiple design solutions. These initial design solutions will be presented in the next appendix.


Brainstorm ronde 3:
Hoe kan je zorgen dat medewerkers zich verbonden voelen met hun collega's?


Beurzen
Informeren
Verloop de acceptatie - drempel door voorbeeld te laten zien
Faciliteren
Stimuleren
belonen
Verleiden
- basisbehoefte
- goed aanbod
- positieve voordelen
Bekend
Collega's?
nieuw
Communicatie hoe iemand bijdraagt aan het geheel
Buddy programma
Top - down te werken
= Paulus
Openbare ruimte inrichten
Door ook andere voertuig door BEVuF FCEV te vervangen b.v. WIS
Competitie
Communicatie via app
ecosysteem
HAALBAAR
Heldere doelen voor Allen
Als groep benaderen.
Samenwerken beloven
Instellen van groepsbeloning
- afd.
- locatie
- ....
Cveeer een 'wij' gevoel'ch
(= Paulus)
Uitjes
Tijd Vrijden voor teambuil
Sportevenementen
Samenstelling
Niet


flipchart pad
STAPLES


TAPLES
CREATIEVE SESSIES
CUSTOMER JOURNEY
EXPERIENCE ROOMS IDEAS
VR
WhatsApp
Facetime
INTERACTIVE COMMUNICATIE
AR
DAG GRATIS VOOR EIGEN GEBRUIK (CONSUMENTEN)
STAPLES
DRAAG COMPANY / JE EIGEN WAARDE UIT
MAKELIJKER PAKKEREN
FILMPJE
NO HASSLE

Appendix F: Initial design solutions

Solution 1: Experience workshop

In order to familiarise the employees with the car sharing service, an immersive full-day workshop will be given multiple times a year. During this workshop day, employees learn how to safely and efficiently drive an electric car, how to charge the car and how to use the Greenwheels booking interface. Additionally, the impacts of personal car usage and the benefits of corporate car sharing will be clearly communicated.

The experience workshop will be given using a mixture of interactive digital and real-life demonstrations. Participants will practice using the booking interface using their own device, after watching a demonstration by the workshop coach. Additionally, VR technology will be used to let the participants experience driving a wide variety of electric cars. Lastly, a real-life demonstration of the car will show the participants how to operate it correctly.

In order to motivate employees to participate in the experience workshop, it will need to be both engaging and enjoyable. Therefore, the workshop will be combined with a teambuilding activity. By collaborating with local Volkswagen car dealerships, participants will get an exclusive driver's training at an external location. This way, participants are able to experience the latest electric car models of Volkswagen and to improve their driving skills at the same time in a fun and safe way.

Solution 2: Unity platform

Explaining the benefits of car sharing and showing employees how to use the booking interface might not be enough to motivate employees in the long-term. Therefore, this concept direction aims to motivate employees to keep using the service over a longer period of time.

Incentives will be created by providing the employees with the Unity platform. This is a internal car sharing platform based on gamification. On this platform, employees will be able to earn virtual points, representing their share of contribution to the overall goal of sustainable corporate car mobility. For example, users are able to earn points by car pooling to an appointment together, or by getting other employees to jQAoin the car sharing program. By communicating these scores in the form of leaderboards, a competition element between users or groups of users is created.

Additionally, the platform will feature a number of online courses, training the users how to use the booking interface, the shared car and how to troubleshoot any technical issue that could easily be fixed. Furthermore, the platform enables online discussions between users, and between users and mobility managers. These online discussions will contribute to a feeling of community amongst the employees who use the car sharing service.

Solution 3: Ambassador program

The ambassador program revolves around peer-to-peer learning. Employees who are new to the company, or new to the car sharing service, get paired with a more experienced colleague, also known as an “Ambassador”. This way, inexperienced employees are able to quickly learn how the car sharing service works, while also making new social connections with different people within the organisation. After the inexperienced employee has finished his or her training, they will become an Ambassador themselves. Consequently, they will pass on their knowledge to other inexperienced employees, thereby creating a snowballing effect.

In order to incentivise employees to participate in the Ambassador program, Ambassadors are able to earn a number of personal rewards. For example, ambassadors could earn credits for using the public fleet of Greenwheels vehicles outside of work hours each time they successfully trained a new user.

To support the ambassador program, Greenwheels will provide the required training materials, the reward system and a method for communicating succes stories to other employees within the organisation.

Appendix G: Validation session

A validation session was organised at the Greenwheels headquarters in Rotterdam. The session included the B2B product manager and a sales manager. The goal of this session was to evaluate and elaborate upon the concept directions presented earlier.

First, a short introduction was given on the project scope, outcomes of the analysis phase and the resulting design challenges. Next, the outcomes of the creative sessions (idea clusters and concept directions) were presented. Afterwards, a quick brainstorm round took place to determine which criteria could be used to evaluate the concept directions. In the end, the following criteria that were identified:

C1: Ability to transfer knowledge
C2: Feasibility
C3: Scalability
C4: Ability to motivate users
C5: Longevity
C6: Value for Greenwheels

Evaluation of concept directions

Using the list of criteria, the concept directions were discussed and evaluated one by one. In order to visualise the outcomes of these evaluation rounds, Harris profiles (Roozenburg & Eekels, 1998) were created.

Experience workshop

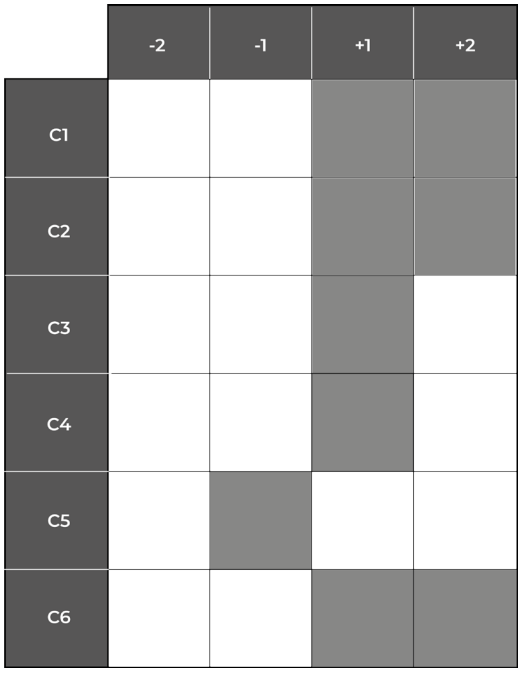


Figure 5: Harris profile experience workshop.

The experience workshop concept was found to be highly valuable for Greenwheels. It offers a simple yet engaging way to train the employees in a short period of time. Additionally, the participants found this concept to be the most feasible of the three directions. However, within this concept direction the users are only activated for a short period of time. After the experience day is finished, employees will need to have enough intrinsic motivation to continue using the service and community building is no longer actively stimulated.

Unity platform

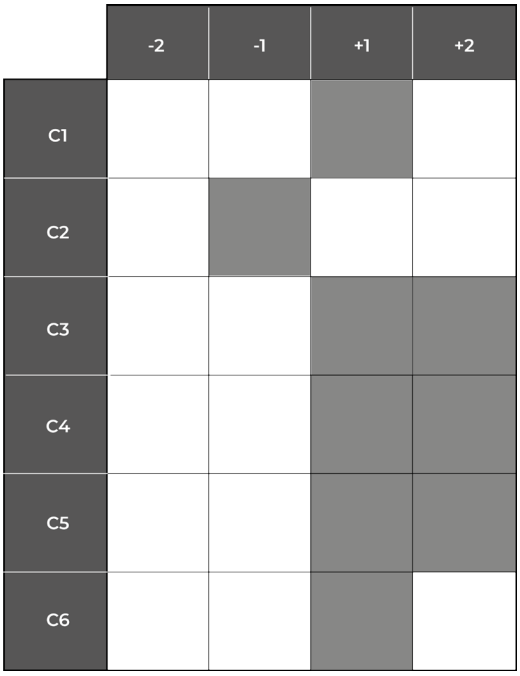


Figure 6: Harris profile gamification platform.

The second concept direction mainly showed strengths in scalability and user engagement. Users remain stimulated to use the car sharing service for a longer period of time and the platform could easily be implemented in both larger and medium sized organisations. However, one of the downsides to this concept direction is its feasibility. Developing, hosting and maintaining an online platform would take a larger amount of time and resources compared to the other two concepts directions.

Ambassador program

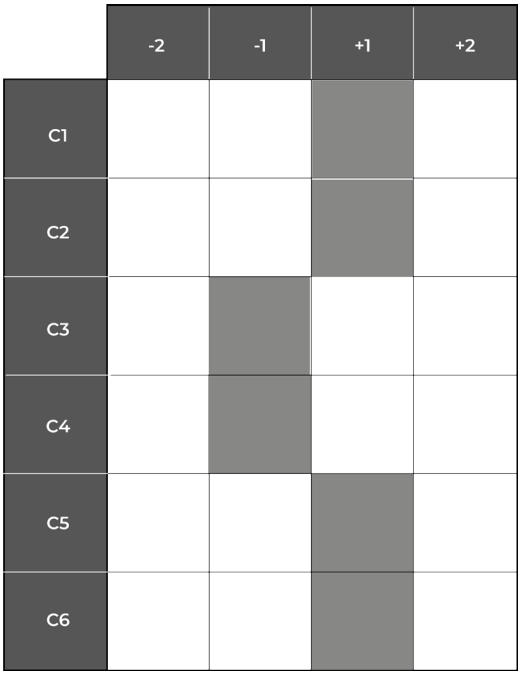


Figure 7: Harris profile ambassador program.

The Ambassador program was also evaluated as a valuable concept direction. During the session, it became clear that the participants had heard about the potential of sharing success stories within organisations, and recognised that the sharing of good-practices could be an interesting opportunity for Greenwheels as well. Furthermore, this concept direction would have impact over a longer period of time, without needing much guidance by Greenwheels employees. Nonetheless, some downsides were identified as well. First of all, it will be hard to incentivise the ambassadors to set aside enough time for training new users. Additionally, an unintentional barrier could be created by requiring people to actively participate in the program after signing up. Therefore, there would be a risk that employees would not want to join the car sharing program all together.

Choosing the concept direction
By weighing the pros and cons of each concept direction, it was concluded that both the experience workshop and the Unity platform were promising directions to proceed with. Consequently, a discussion took place on how these two concept directions could be merged into a single stronger concept direction.

The outcome of this discussion was that the new concept direction would still feature the experience workshop day in order to give the employees an exciting introduction to the car sharing service. Additionally, a 'simplified' version of the Unity platform will be provided, in order to create long-term incentives for using the service. The Unity platform will also be used during the experience workshop to actively promote employees to join the platform.

Furthermore, the participants of the validation session stressed the importance of rewarding 'optimal' usage of the shared cars over the frequency of usage. Rewarding users purely for using a shared car would give certain employees, who frequently have appointments outside of the office, an unfair advantage. Moreover, incentivising the usage of the shared cars could potentially have negative financial and environmental effects, in case the trip would otherwise be undertaken by biking, walking or taking the train.

Appendix H: Service improvements

Several incremental improvements are suggested for the current CCS service. These suggestions are based on the outcomes of the service analysis and the interviews with end-users and industry experts (see Chapters 4 & 7).

Providing a dashboard for mobility managers
Currently, mobility managers are not provided with a personal online dashboard for managing their fleet of shared cars However, these stakeholders indicated that such a tool would significantly help them increase their job performance. For example, during the interview with Gertjan Sybrandi (see Chapter 7), he explained that other service providers often offer an online dashboard to monitor efficiency statistics and easily create reports for the organisation's management. Therefore, it would be advisable for Greenwheels to offer such a dashboard as an integral part of their CCS service.

Figure 8: MIND mobility dashboard.

Offering such a fleet management dashboard can be realised by collaborating with MIND Mobility. This company is also a subsidiary of Pon Holdings and already works together with Greenwheels on a limited basis. By integrating MIND's hardware with the system of Greenwheels, it will become possible to offer mobility managers a fleet management dashboard (see figure 8) and to gather useful data about the technical status of the car. Additionally, it will become possible to collect data on the driving style of the employees (see figure 9).

Figure 9: Driving score feedback on mobile device.

Improving the User Experience
Furthermore, a number of incremental improvements were found for the user experience of the CCS service. The following improvements are suggested:

- Integrating navigation, parking and charging services into the booking application, to provide users with a one-stop solution.

- Introducing a notification system in order to warn users shortly before the start of a reservation. At the same time, giving the user the option to quickly cancel the reservation in case it is no longer needed. This feature would help reduce the amount of no-shows.

- Communicating the fuel or battery level of the shared cars to help users pick the right car for their trip. Not every user needs a fully charged car and some users might be happy to take one of the lesser charged ones if they plan to make a short trip. Implementing this feature could also reduce annoyance among users who need to make a long trip and are faced with a vehicle which is almost empty.

- Making it possible to perform last-minute changes and cancellations to a reservation, even after the start-time has passed. Users indicated that this is currently not possible and therefore a lot of car availability is 'lost'.

- Showing users the environmental impact their journey in order to make them more aware of their own contribution to climate change. This feature could help motivate the users towards improving their driving style or choice of vehicle.

- Rating the car on arrival for cleanliness using a 5-point scale. This feature would help estimate which cars need to be cleaned instead of relying on fixed intervals.

- Making the shared cars completely key-less and removing the board-computer would reduce the amount of issues with the key transfer. Users will only need the application on their phone to lock or unlock the car. Starting the engine will be done by pressing a button on the dashboard of the car.

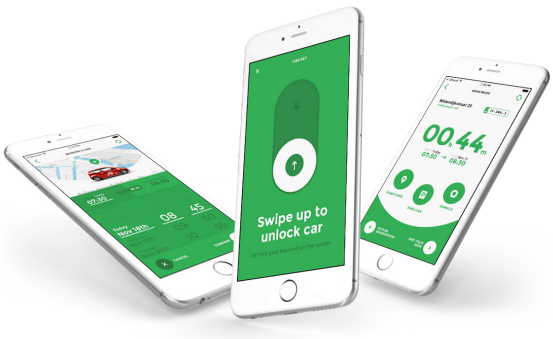


Figure 10: Greenwheels mobile application.

Appendix I: AIDA model

The AIDA model (Rawal, 2013) was used in order to visualise the goal of the Experience Workshop and Unity platform (see figure 11). The model shows which steps an employee takes from being unaware of the CCS service, towards actively being engaged with the service. These steps are: Awareness, Interest, Desire and Action. The model also shows which steps the mobility manager needs to take and during which steps the Experience Workshop and Unity platform will support the mobility manager.

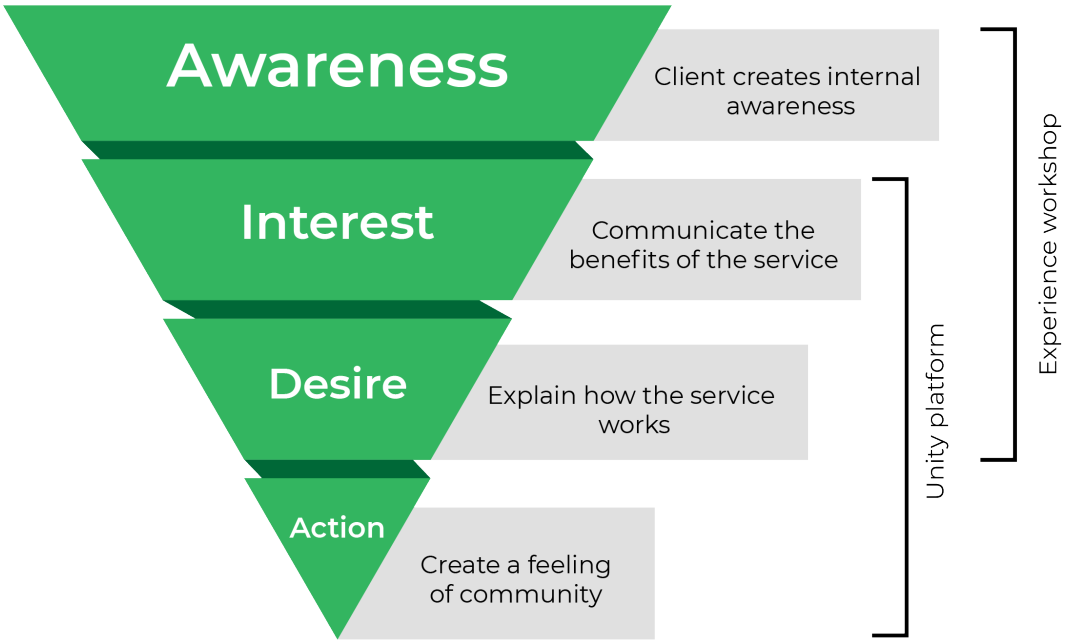


Figure 11: AIDA model showing how the chosen concept direction will support the mobility manager in stimulating employees to start car sharing.

Appendix J: Experience Workshop Outline

1. Introduction presentation (30 min).
2. User profile creation (20 min).
3. Booking interface demonstration (15 min).
4. User practice with booking interface (60 min).
5. Demonstration of the shared car (30 min).
6. Lunch break (60 min)
7. Participants travel to the external location using shared cars (60 min).
8. Drivers training experience (240 min).

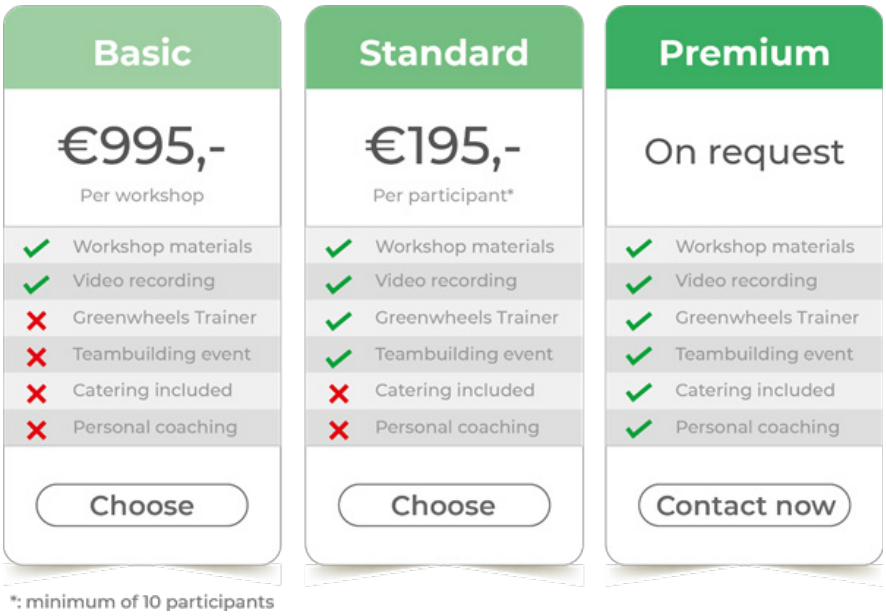
Appendix K: Business case example Experience Workshop

In order to determine how the Experience Workshop captures value for Greenwheels, a business case example was created.

Note that this business case is based on a rough estimation. It uses figures of current clients to estimate the number of users, shared cars and reservations per month. The costs of the customer support team and fleet checkers were provided by Greenwheels.

Pricing Experience Workshop

The pricing of the Experience Workshop is as follows:



Assumptions

The following assumptions were made for the client:

- The client chooses the standard Experience Workshop package.
- There are 6 shared cars at the client location.
- The CCS service is being used by 75 employees.
- 25 employees participate in the Experience Workshop.
- On average, there are 250 reservations per month.

The following assumptions were made for the costs:

- Each car is serviced 5 times a year by the fleet checkers.
- Employees contact customer support during half of the trips.
- Customer support calls costs €5 per call.
- Sending a fleet checker to service a shared car costs €220 each time.

The following assumptions were made for the result of the Experience Workshop:

- There will be 50% less customer support requests after the Experience Workshop is given.
- Fleet checkers will need to service each shared car 3 times per year instead of 5.

Cost savings Greenwheels

- Customer support will save €312,50 each month on this client.
- Operational costs are reduced with €2640 per year.

Furthermore, the Experience Workshop itself results in additional revenue and costs. These figures are as follows:

- The client pays €4875 for the Experience Workshop package.
- The Greenwheels trainer costs €200 per workshop.
- Video recording costs €250 per workshop.
- The teambuilding event costs €3000 for 25 participants.

Therefore, the net profit for Greenwheels in this scenario will be €1425.

Appendix L: Consumer behaviour research

The chosen design solutions still offered a large amount of different opportunities. Therefore, additional research was done in order to support the process of conceptualisation. This chapter discusses the Fogg Behavioural Model and Octalysis gamification framework in order to understand which elements need to be designed.

Fogg Behaviour Model

A widely used model for understanding persuasive design is the Fogg Behaviour Model (FBM). This model (see figure 12) describes three determinants for predicting whether someone will perform a certain behaviour: (1) motivation, (2) ability and (3) triggers.

In short, motivation refers to the degree someone wants to perform certain behaviour, ability refers to the means someone has to actually do so (e.g. money, time, knowledge) and triggers refer to small reminders that cause the behaviour to start (e.g. a notification, alarm or advertisement). All three elements need to be present in order for the person to perform the target behaviour.

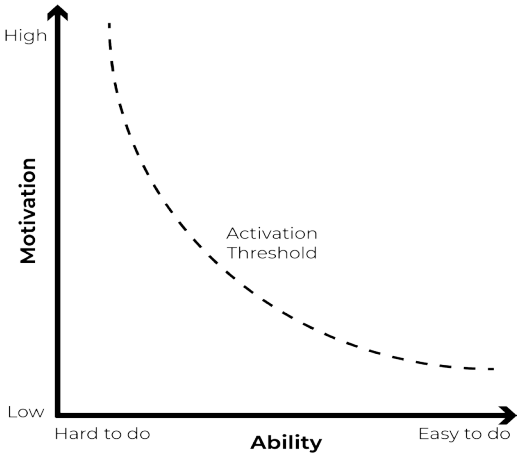


Figure 12: FBM. Based on Fogg (2009).

The FBM implies that motivation and ability have a trade-off relationship. For example, someone might have a very low motivation for buying a new piece of clothing, however, because the product is on sale (low price thus high ability) will still buy it.

This model also helps to better understand the goal of the gamification platform. The goal of the platform is to raise the motivation and ability of the employees to use the CCS service, in order to increase the chance it will be used often.

By placing the current behaviour and target behaviour in the FBM, it can be concluded that employees are lacking both in motivation and ability to use the CCS service optimally. However, it is clear that motivation needs to be increased further than the user's ability (see figure 13).

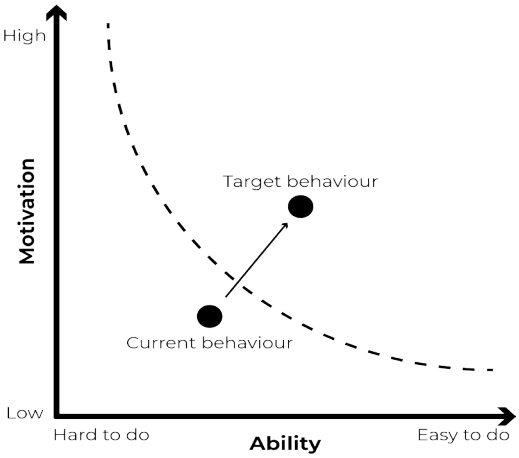


Figure 13: Current and target behaviour. Based on Fogg (2009).

The ability of employees will be increased by training them. However, motivation needs to be stimulated in a different way. Therefore, gamification will be used to stimulate the motivation of the employees.

Gamification
The Unity platform will feature multiple gamification elements in order to motivate the users. However, it is important to understand what gamification is and how gamification elements work before designing the platform. Therefore, additional research into gamification was performed. As a starting point, gamification can be defined as:

"Gamification is an umbrella term for the use of video game elements to improve user experience and user engagement in non-game services and applications"

- Deterding et al. (2011)

One of the gamification pioneers is Yu-kai Chou. He developed a gamification framework (Chou, 2015) which identifies the eight core drivers of human motivation (see figure 14).

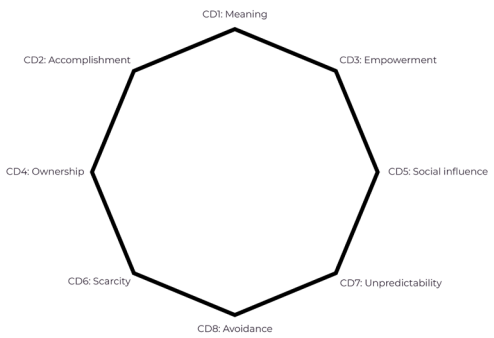


Figure 14: Octalysis framework. Based on Chou (2015)

As can be seen in figure 14, the Octalysis framework is based on eight core drives, these are:

CD1. Meaning and calling
CD2. Development and accomplishment
CD3. Empowerment of creativity
CD4. Ownership and possession
CD5. Social influence
CD6. Scarcity and impatience
CD7. Unpredictability
CD8. Loss and avoidance

Of these core drives, CD 1, 2 and 3 are considered positive motivators, while CD 6, 7 and 8 are seen as negative motivators.

Positive motivators stimulate people to become engaged by allowing them to express themselves, feel successful and achieve a higher sense of meaning. On the other hand, negative motivators rely on fear of losing something, not being allowed to have something, or because something is unpredictable and inspires curiosity. These motivators are referred to as 'negative' because people often feel like they are not in control of their own behaviour.

Additionally, a distinction between extrinsic and intrinsic motivators can be made. The left half of the framework shows the extrinsic motivators (CD2,4,6), while the right side shows the intrinsic motivators (CD3,5,7).

Extrinsic motivators use logic, calculations and ownership elements to stimulate people to want to obtain something (e.g. points or virtual currencies). Intrinsic motivators are related to creativity and social aspects. Users don't need to be rewarded to participate in this type of behaviour since they are inherently rewarding. It will be important to strike a balance between these four types of gamification in order for the Unity platform to become successful.

Designing the Unity platform
By considering the eight core-drives the following gamification elements were selected in order to create a balanced user experience:

CD1
- Helping society and the environment.
- Contributing to the company goal of becoming more sustainable.

CD2
- Completing challenges
- Progress bar
- Gathering points
- Finishing courses
- Beating another group

CD3
- Customising your profile
- Ability to improve your driving style
- Instant feedback

CD4
- Monthly leaderboard
- Owning badges
- Usage statistics
- Gaining currency
- Personal title

CD5
- Adding friends/co-workers
- Creating and joining groups
- Car pooling feature
- Share scores with others
- Mentoring other users

CD6
- Unlocking new courses
- Unlocking new trophies

CD7
- Easter eggs
- Surprise rewards
- New challenges every month

CD8
- Daily login rewards
- Profile sunk-cost

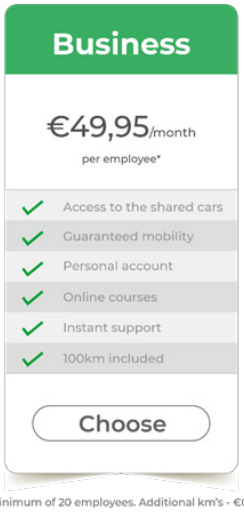
Mapping the Unity platform in the Octalysis framework created an overview of the gamification elements that will be included (see figure below). Furthermore, the framework shows that there is a balance between intrinsic, extrinsic, positive and negative elements, however, CD6,8 and 3 could be improved to create a more balanced gamification experience.

Appendix M: Business case example Unity platform

In order to determine how the new business model captures financial value for Greenwheels, an example business case was created. Note that this business case is based on rough estimations. It uses figures of current clients to estimate the number of users, shared cars and reservations per month. The costs of the customer support team and fleet checkers were provided by Greenwheels.

Pricing Unity platform

The pricing strategy of the Unity platform is based on the number of users. Currently, the CCS service is sold based on a fixed monthly fee per shared car (price depends on type of car), in combination with a flat service fee (€250 per month per car). The new pricing strategy will be simplified to a single monthly subscription per employee, in combination with a variable fee for each km driven. In return, Greenwheels will ensure that enough cars are placed at the client location. The pricing is shown below.



Assumptions

The following assumptions were made for the client:

- There are 6 shared cars at the client location.
- The CCS service is being used by 75 employees.
- On average, there are 250 reservations per month.
- The average distance per trip is 50km.

The following assumptions were made for the costs Greenwheels makes:

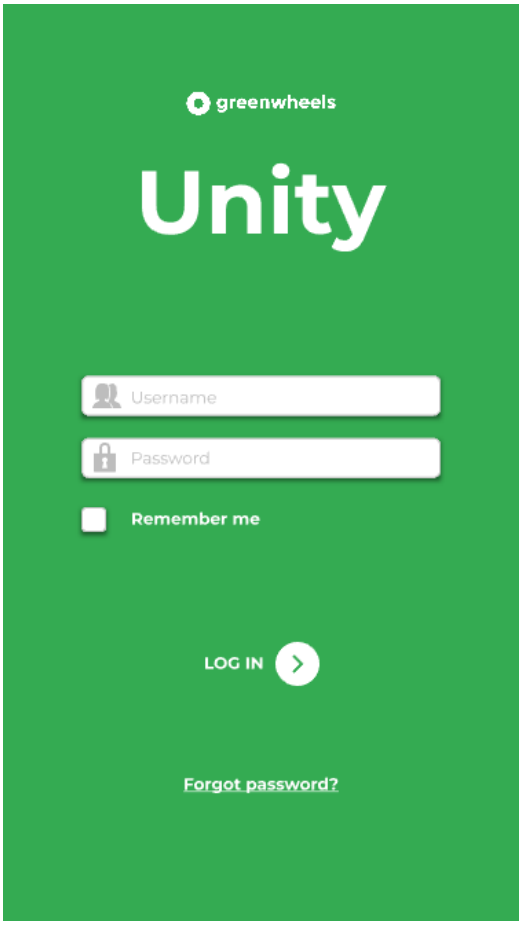
- The leasing costs for the shared electric cars are €450 per month.
- Service costs per shared car are reduced to €150 per month.

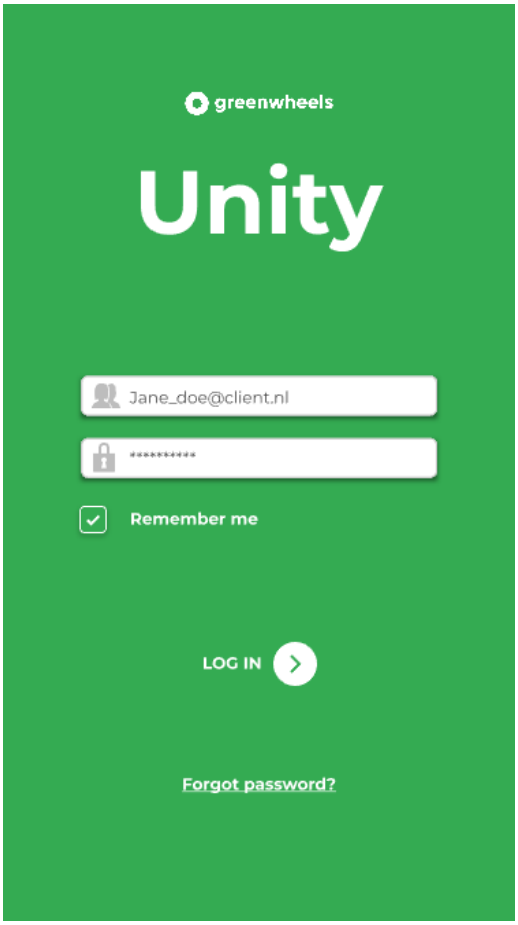
Financial returns Greenwheels

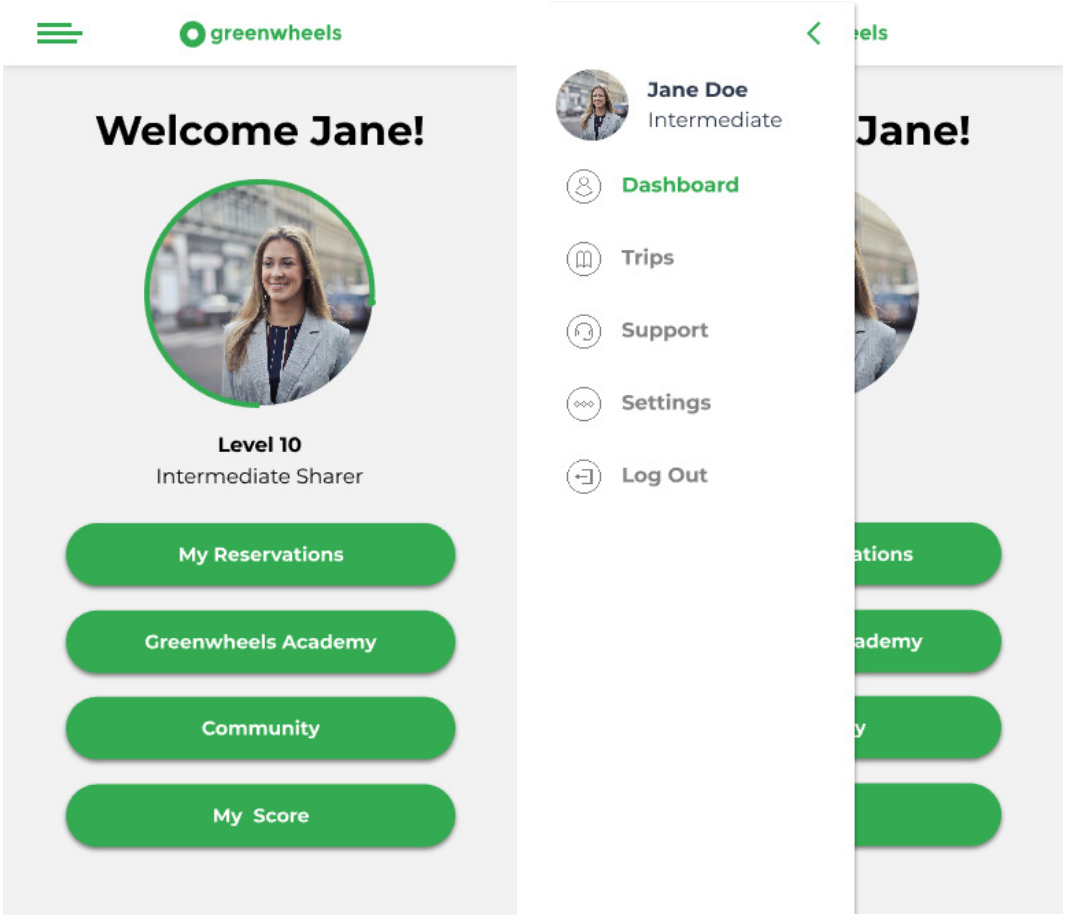
- The subscription fees generate €3746,25 per month.
- The extra KMs return €1000 per month.
- Total costs (including lease and service costs) for the shared cars are € 3600.-

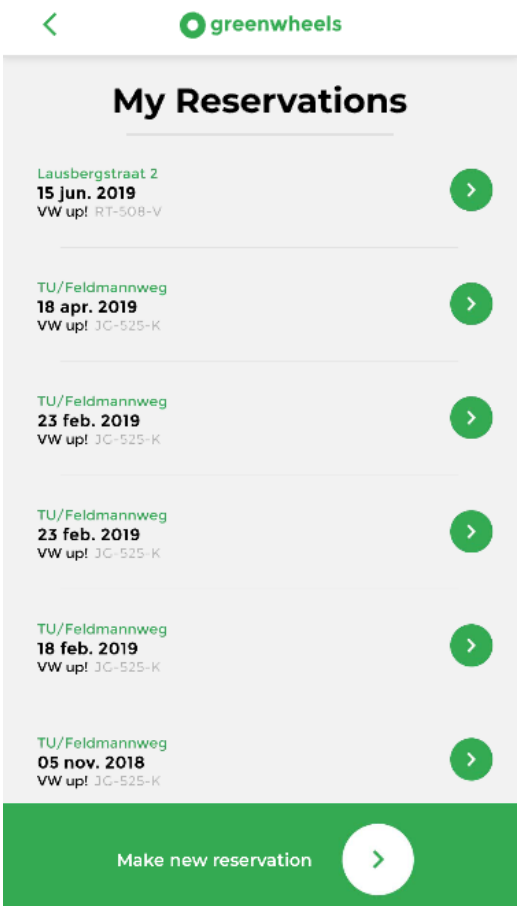
Thus, net profit from this client would be €1146,25 per month.

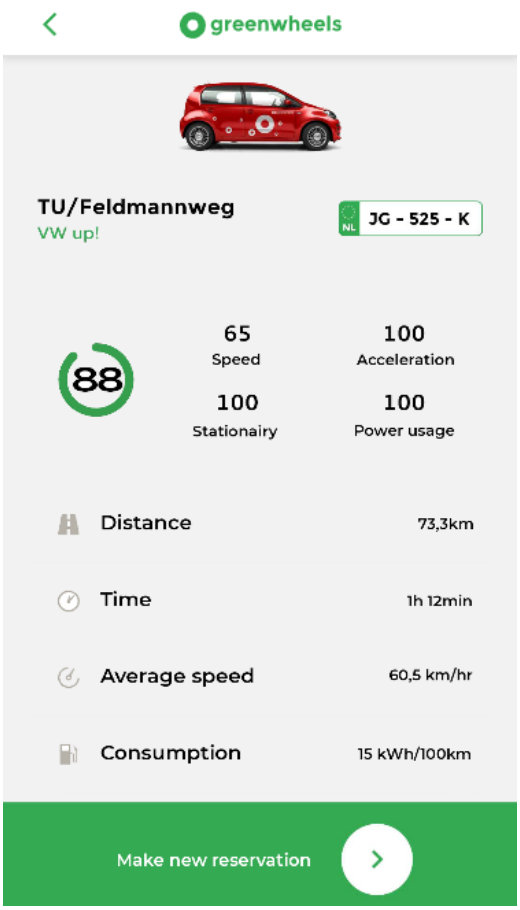
Appendix N: User Interfaces

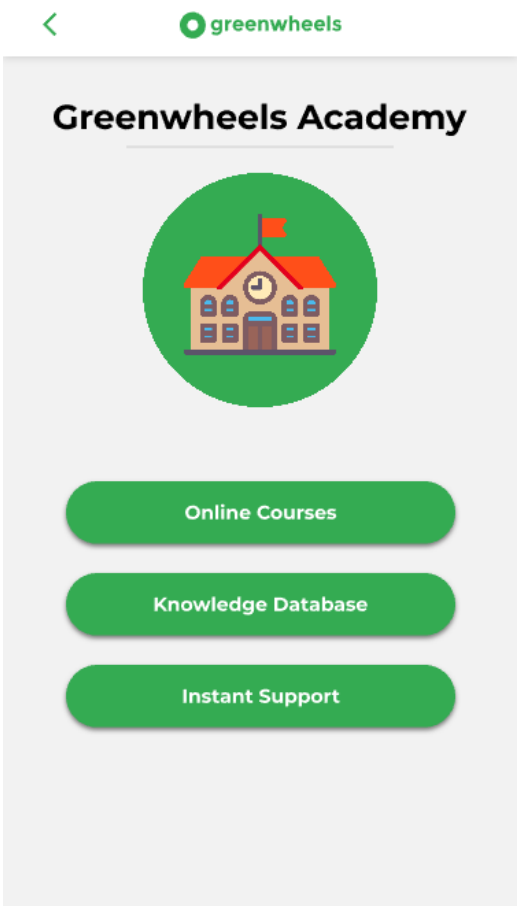


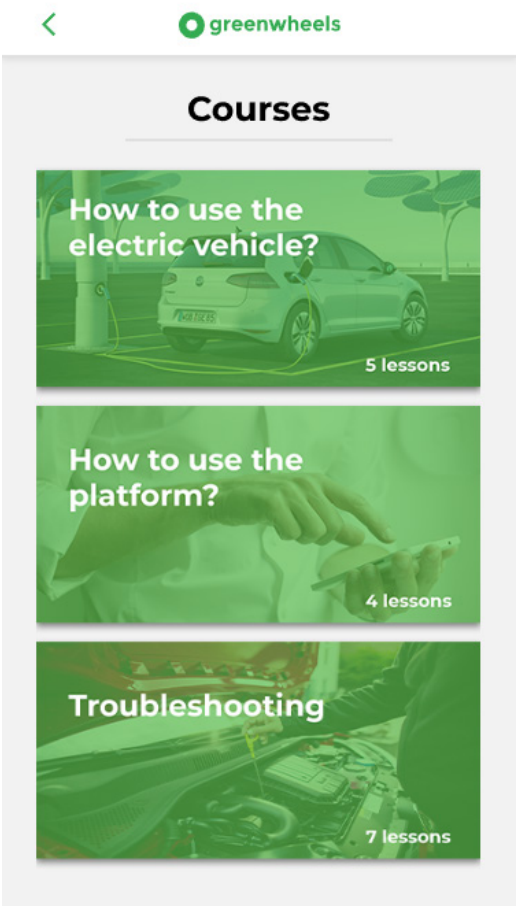


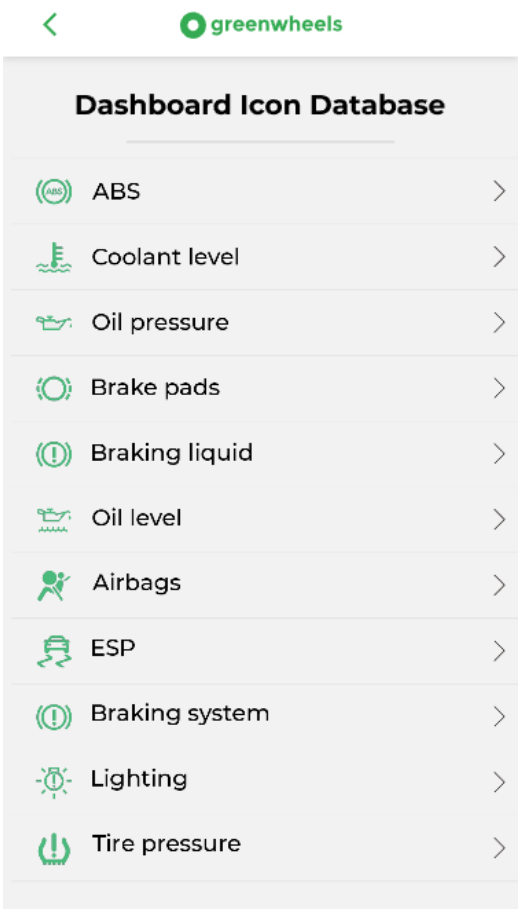

greenwheels
Welcome Jane!
Level 10
Intermediate Sharer
My Reservations
Greenwheels Academy
Community
My Score
Jane Doe
Intermediate
Dashboard
Trips
Support
Settings
Log Out

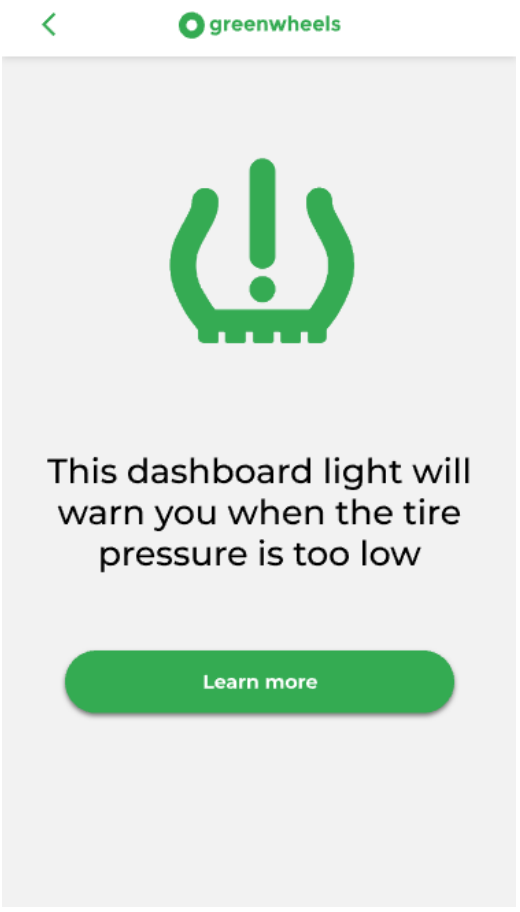

greenwheels
My Reservations
Lausbergstraat 2
15 jun. 2019
VW up! RT-508-V
TU/Feldmannweg
18 apr. 2019
VW up! JG-525-K
TU/Feldmannweg
23 feb. 2019
VW up! JG-525-K
TU/Feldmannweg
23 feb. 2019
VW up! JG-525-K
TU/Feldmannweg
18 feb. 2019
VW up! JG-525-K
TU/Feldmannweg
05 nov. 2018
VW up! JG-525-K
Make new reservation

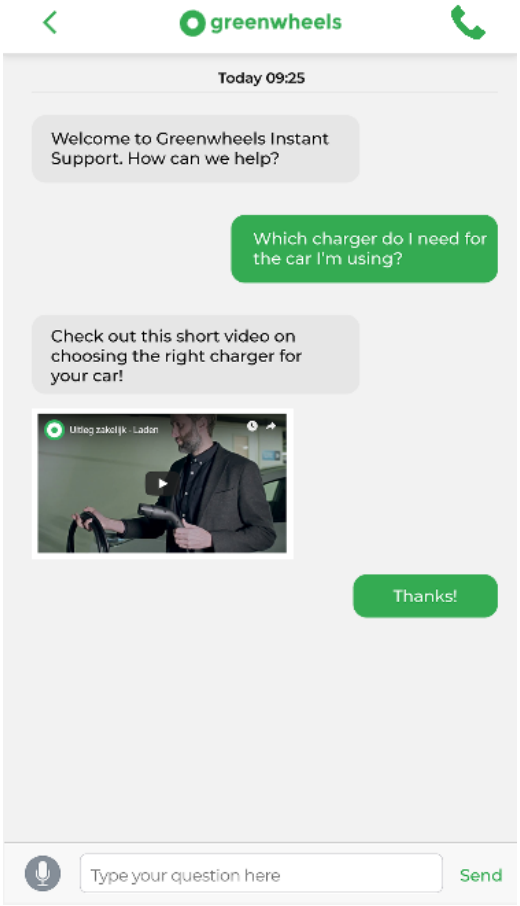

greenwheels
TU/Feldmannweg
VW up!
NL
JG - 525 - K
88
65
Speed
100
Acceleration
100
Stationairy
100
Power usage
Distance
73,3km
Time
1h 12min
Average speed
60,5 km/hr
Consumption
15 kWh/100km
Make new reservation

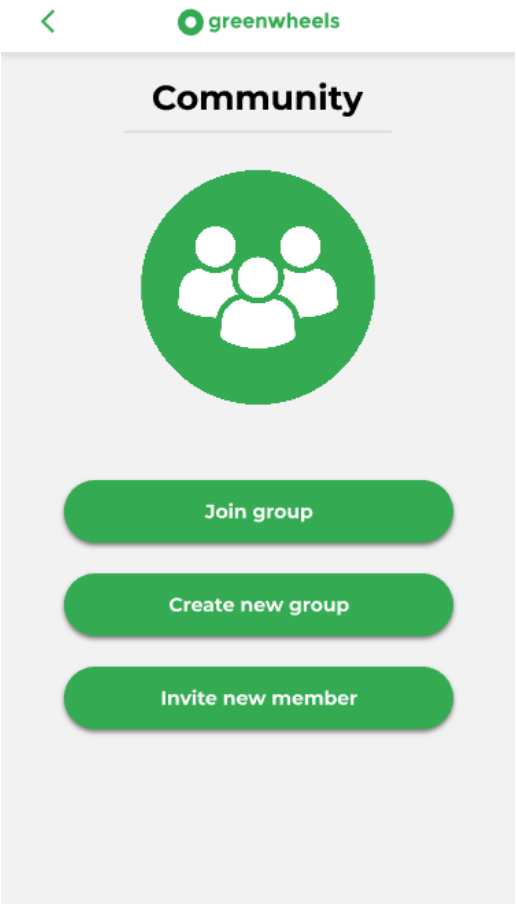

greenwheels
Greenwheels Academy
Online Courses
Knowledge Database
Instant Support

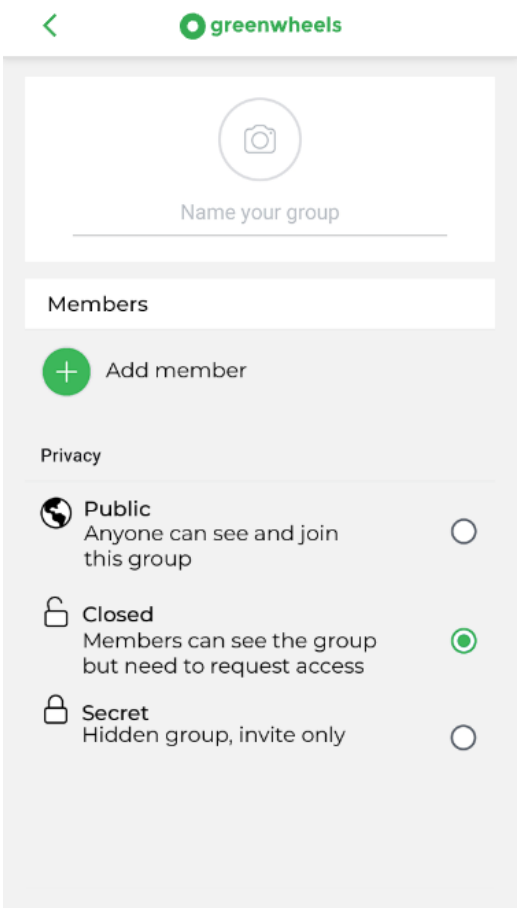

greenwheels
Courses
How to use the electric vehicle?
5 lessons
How to use the platform?
4 lessons
Troubleshooting
7 lessons

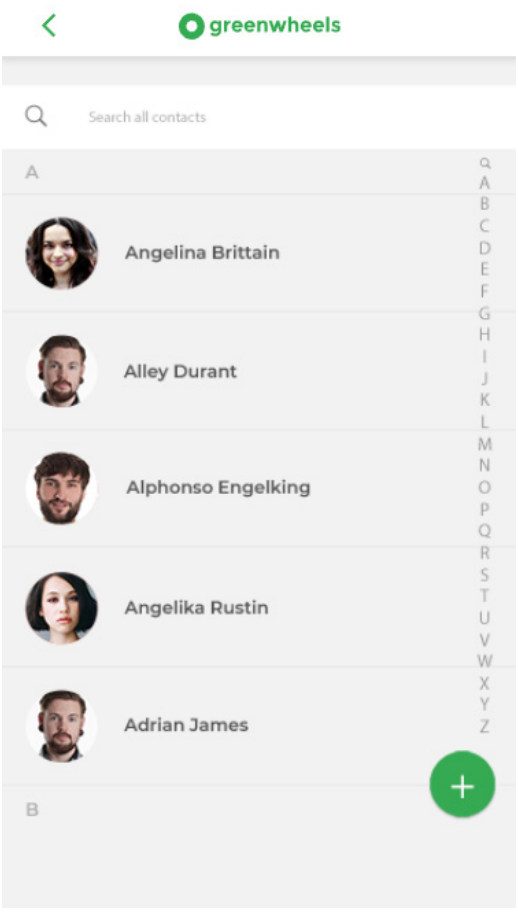

greenwheels
Dashboard Icon Database
ABS
Coolant level
Oil pressure
Brake pads
Braking liquid
Oil level
Airbags
ESP
Braking system
Lighting
Tire pressure

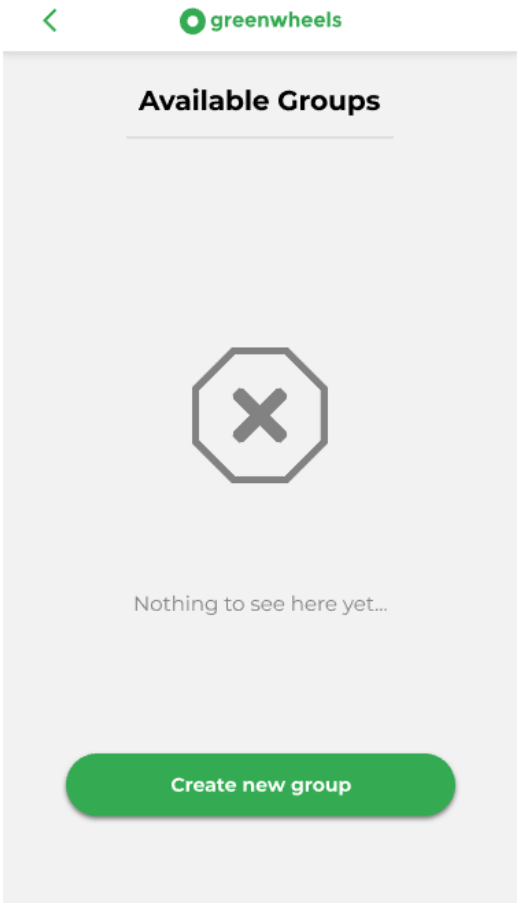

greenwheels
This dashboard light will warn you when the tire pressure is too low
Learn more

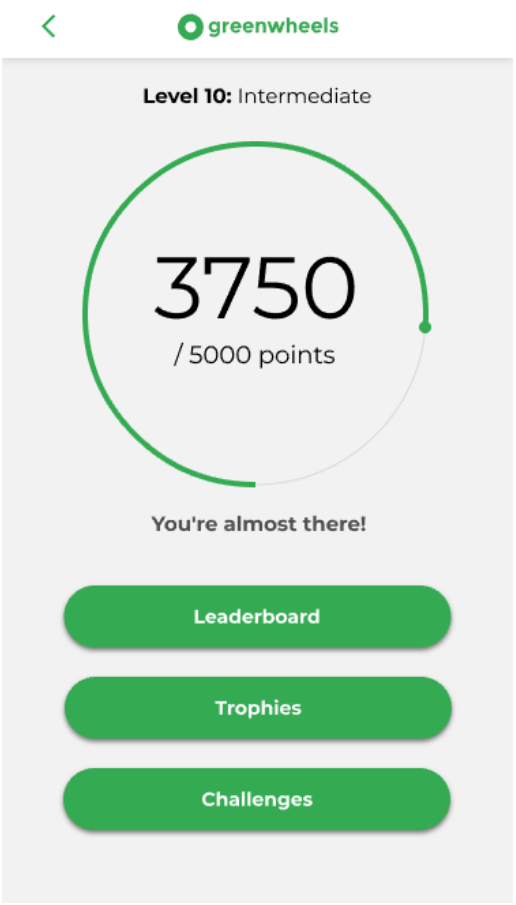

greenwheels
Today 09:25
Welcome to Greenwheels Instant Support. How can we help?
Which charger do I need for the car I'm using?
Check out this short video on choosing the right charger for your car!
Thanks!
Type your question here
Send

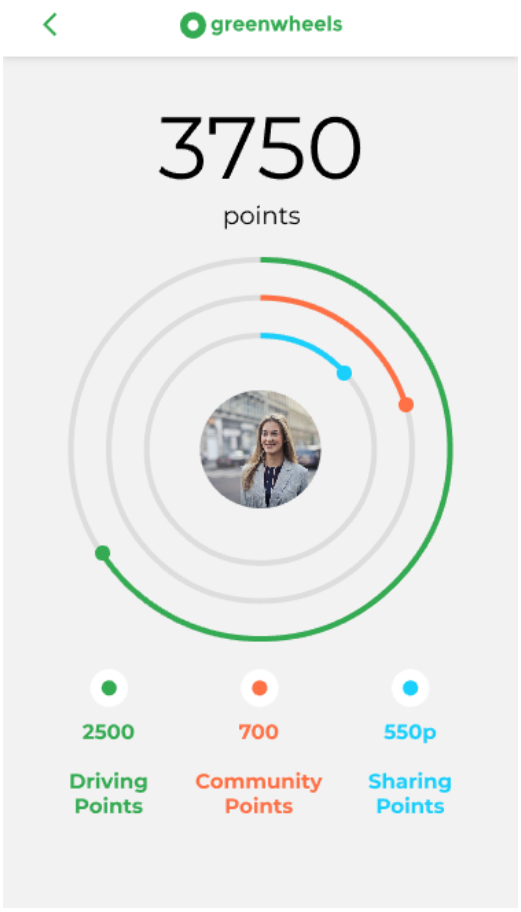

greenwheels
Community
Join group
Create new group
Invite new member

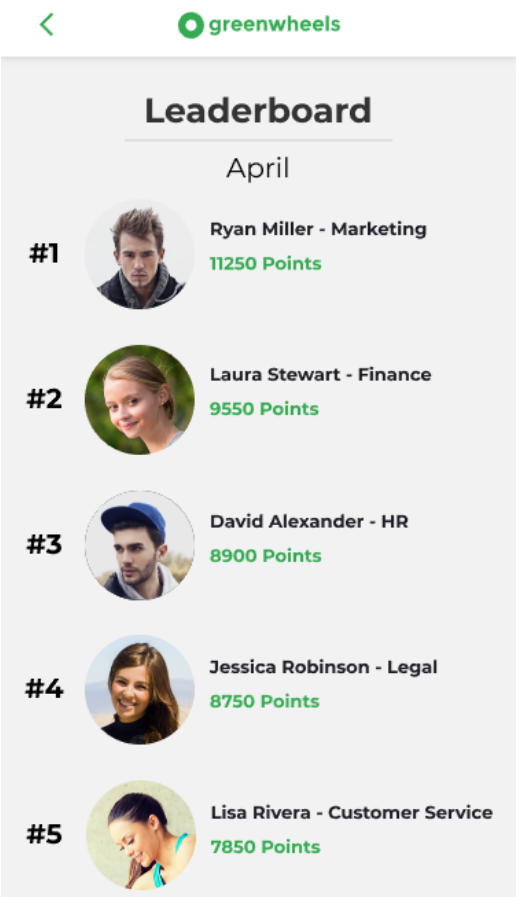

greenwheels
Name your group
Members
Add member
Privacy
Public
Anyone can see and join this group
Closed
Members can see the group but need to request access
Secret
Hidden group, invite only

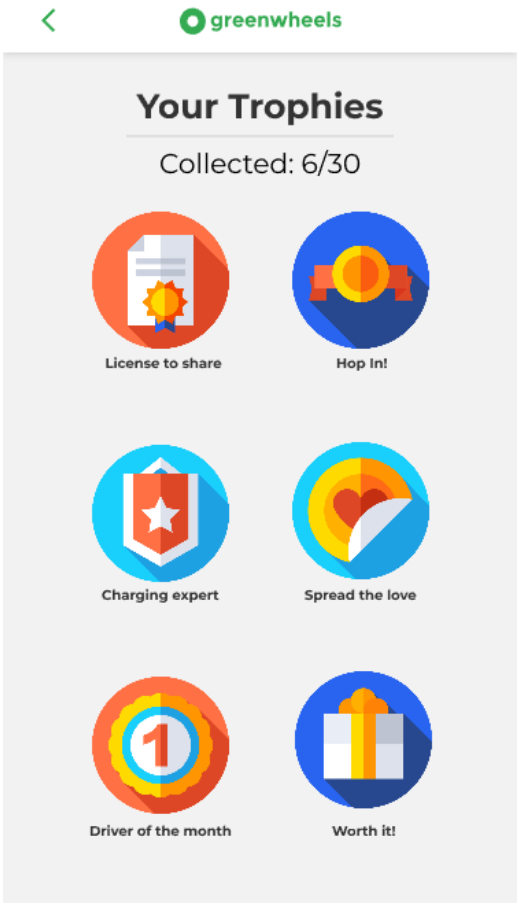

greenwheels
Search all contacts
A
Angelina Brittain
Alley Durant
Alphonso Engelking
Angelika Rustin
Adrian James
B
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

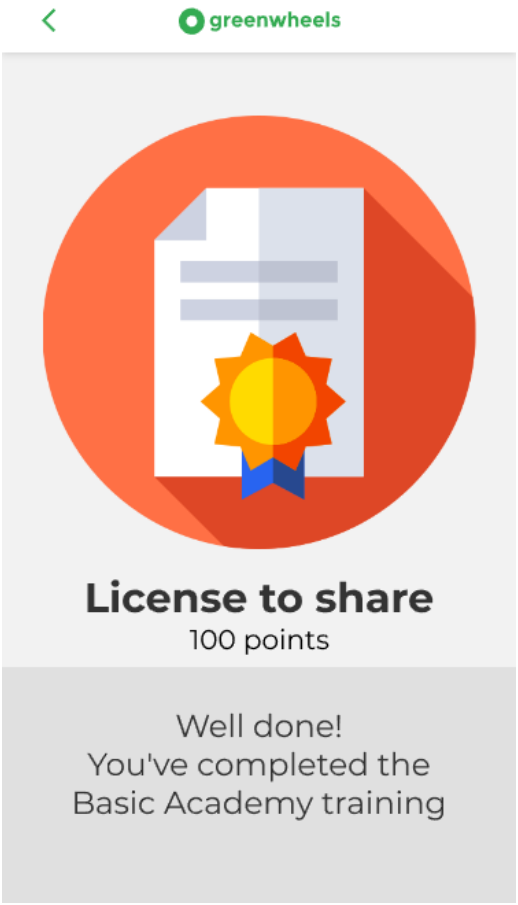

greenwheels
Available Groups
Nothing to see here yet...
Create new group

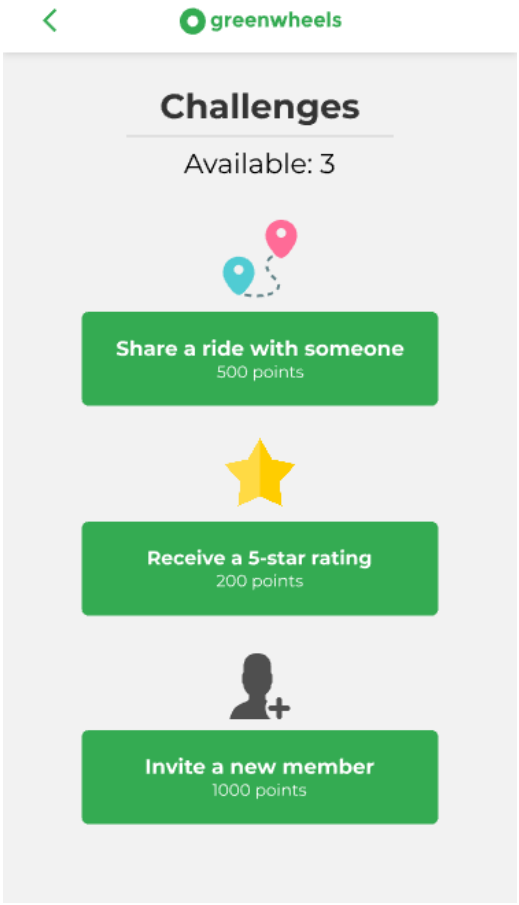

greenwheels
Level 10: Intermediate
3750
/ 5000 points
You're almost there!
Leaderboard
Trophies
Challenges


greenwheels
3750
points
2500
Driving Points
700
Community Points
550p
Sharing Points


greenwheels
Leaderboard
April
#1
Ryan Miller - Marketing
11250 Points
#2
Laura Stewart - Finance
9550 Points
#3
David Alexander - HR
8900 Points
#4
Jessica Robinson - Legal
8750 Points
#5
Lisa Rivera - Customer Service
7850 Points


greenwheels
Your Trophies
Collected: 6/30
License to share
Hop In!
Charging expert
Spread the love
Driver of the month
Worth it!


greenwheels
License to share
100 points
Well done!
You've completed the
Basic Academy training


greenwheels
Challenges
Available: 3
Share a ride with someone
500 points
Receive a 5-star rating
200 points
Invite a new member
1000 points