IMPROVING THE PICNIC RUNNER'S EXPERIENCE

Applying user experience to vehicle design

PREFACE

This report is the result of my graduation project for the MSc Design for Interaction course at the Technical University of Delft. This project was done in partnership with Picnic over a 5 month period.

This project allowed me to work as an user experience designer in a real world situation with development and decision that positively impacted the users. It was an amazing chance to be able to work alongside professionals and learn to work as a team. Big thanks to Picnic for supporting me with my ever changing project and encouraging me to explore further. I am also grateful for all the Runners who were open to helping me research them as users.

This is my journey and what I discovered. Enjoy!
       Ben Collin

EXECUTIVE SUMMARY

The aim of this thesis is to implement knowledge of a user's experience into vehicle design. Picnic is developing a new delivery vehicle and this project will explore what could be improved on the current ePV for the ePV2. The target user, the Picnic Runner is researched thoroughly to find where the ePV design lacks positive user experience. Problems around the current vehicle were assessed within the research stage with consideration of known foreseen problems with the new design. The Runner's perception of safety was a found issue and a design was a concept created to help them work safer. This project is concluded with a design proposal that is grounded via research and tested prototypes.

GLOSSARY

Cabin / Cockpit: *The area at the front of the vehicle, this is where it is driven from.*

Canvas: *The material used as a door for the G4 cargo box.*

Cargo box: *The box on the back of the ePV that holds the frame.*

Delivery / Runner sheet: *A sheet of paper that informs the Runner of the delivery details.*

Drop time: *The amount of time it takes a Runner to make one delivery.*

Ecommerce: *A process of buying and selling of products or services, making money transfers and transferring data over the internet.*

ePV: *Electric Picnic Vehicle, the current model is the G4.*

FC: *Fulfillment center, where the totes are filled with fresh products and loaded onto frames to be transported to hubs.*

Frame: *A large metal framed trolley that holds totes for transport.*

Hub: *A warehouse where the ePVs are kept and loaded/unloaded with frames before and after a delivery shift. Also known as a distribution hub.*

Hub manager: *The manager of the hub, they are tasked with organising the Runners and the deliveries from the FC.*

Last mile delivery: *The movement of goods from a transportation hub to the final delivery destination.*

Runners: *The people who carry out the deliveries. They load the ePVs and drive them to the customer's door.*

Runner +: *A more experienced runner, who assists the hub manager with their daily routine.*

Runner App: *The app on the mobile scanning device that instructs the Runner which totes to take for a delivery.*

Runner trainer: *An experienced Runner that trains new Runner employees*

Scanner: *The device used by Runners to scan the collect totes for delivery.*

Shoppers: *A worker in the FCs and they collect and arrange the product for each order.*

Tote: *A box that holds 3 bags of a customers groceries. A customer's delivery can be 1-4 totes worth. Black totes are for chilled goods and red for ambient.*

Undercarriage: *The equipment that is situated underneath the cargo box.*

A tote full of goods

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.0 PROJECT CONTEXT

INTRODUCTION

In this segment the company, project assignment and context are introduced.

Picnic is an online supermarket that specialises in last mile deliveries. With no physical store front, customers shop and order via the Picnic app. With a low minimum order of €25, deliveries are free of charge and the customers can choose a 20 minute time slot to receive their groceries, allowing them to easily plan it around their daily lives.

Founded in Amersfoort, September 2015, Picnic started with four delivery cars. Currently, Picnic uses more than 800 electric cars that are driving around in more than 70 Dutch places from over 48 distribution hubs. With hundreds of thousands of customers and a monthly expansion to new cities, Picnic was named the fastest growing company in the Netherlands in 2019 by the Erasmus Centre for Entrepreneurship *(ECE, 2019)*.

Picnic is constantly developing and have chosen to create a new delivery vehicle to expand the company further and to reach more customers. The new vehicle will need to be an improvement on the current one in all aspects. This thesis will focus on the main users of this vehicle, the Runners, to explore their current user experience and identify how it can be improved for the new vehicle. This assignment will begin with researching the current user experience and end with a concept that can be implemented in the new design of the vehicle.

A Runner delivering with a tolley

PICNIC'S BRAND

Picnic has a brand image that is based on an old Dutch tradition; the melkboer (the milkman), who would deliver milk to households on a regular basis *[Image 1]*. Most milkmen back then carried other necessity products alongside the milk and were well known to be friendly faces that could be trusted.

Based on this fashion Picnic aims to deliver groceries with a friendly customer interaction to help build trust. The Runners will always greet the customers with smiles and friendly conversation, being playful with children too *[Image 2]*. Even the vehicle is similar to the milk cart with its cute demeanor and unusual shape.

ASSIGNMENT DEFINED

Runners have many problems with the current ePV, the source of these need to be identified and their solutions considered within the new vehicle's design. Although some problems are known, there are many interactions that are overlooked or covered by habits. These problems may include; unnecessary effort, situational stress, unwanted interactions and human errors. The Runner user experience during a shift will be researched and studied for a design opportunity to help improve their job. The design is to be prototyped and tested to identify its effectiveness.

I aim to research the current Runner's work experience that occurs in the hub and around the vehicle. Finding what they like and dislike. This research will produce an overview that can be used as a development tool for Picnic. With a main pain point chosen the concept will be appropriately prototyped for the ePV2. Based on the company's interests this project will be conducted with a major focus on the user experience during shifts; in and around the vehicle. The overall goal of this assignment is to create a prototype that solves a user experience issue and have its creation validated via research. *Design brief in Appx. 1*

Image 1:
The old dutch melkboer

Image 2:
A Picnic Runner

A Runner gathering a delivery
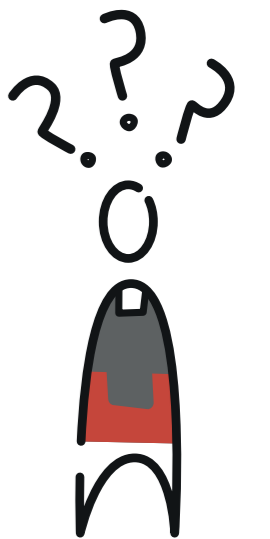
THE ePV

An electric Picnic Vehicle, also known as an ePV is made up of a Groupil G4 which makes up the cabin and undercarriage, and the cargo box is custom made for Picnic's use. The ePV can go up to a max of 50kph which is not fast enough for Dutch highways and thus must navigate the smaller roads. The thinness of the vehicle allows for deliveries in areas that most transit vans can't reach. The cabin sits over the front axle and is a compact space for one driver and one passenger. The dashboard consists of a basic LCD display screen, vehicle controls and a radio. Because of the short nose and large glass space it can often feel freeing, to drive.

The cargo holds 2 frames with a total of 48 totes, one customer's delivery can take up 1 to 4 totes. The cargo box is the same width as the G4 but surpasses it in length and in height, making an unusual driving experience compared to most passenger cars, that takes time to get used to. For reckless and inexperienced drivers this awkward center of gravity can sometimes cause it to tip over. The doors at the rear are for loading and the canvas side doors are for easy access when on deliveries. *[Image 3]*

THE ePV **2**

The aim of the ePV2 is to be an improvement on the current G4 ePV. A more powerful battery, and cargo, will allow for more deliveries to be made and thus longer shifts can be achieved with less hub downtime. The cargo will hold more totes from 48 to 64. A stronger motor opens up faster routes on highways to reach towns and villages outside of cities and such higher speeds require a greater focus on safety. A refrigerated compartment removes the need for ice packs and dry ice within the chilled totes and will keep goods fresh for longer. And a wider wheelbase will improve vehicle's handling and stability. *See Appx 12 for more details.*

The new design is being made by the Picnic distribution team in collaboration with TNO and VDL. This thesis has been done alongside Picnic's ePV2 project. All findings in this project will contribute to the ePV from a user experience perspective.

RUNNER APP
This handy app tells our Runners valuable information - directions, timings and which deliveries go where

ROLLER SHUTTER
Two clicks, a swish and hey presto! Groceries

GLASS CABIN
Runners have a 180° street view. Everyone can see them smiling

WHEELS
With no engine the Runner sits directly above the wheels. This makes parking easy - and with rush hour traffic that's ideal

BATTERY
Centrally placed to provide better balance. The ePV is fully electric, keeping cities and neighbourhoods quiet and clean

WIDTH
The ePV is silm. Runners can get around tight corners and navigate through narrow streets. This allows Runners to park neatly without causing traffic jams
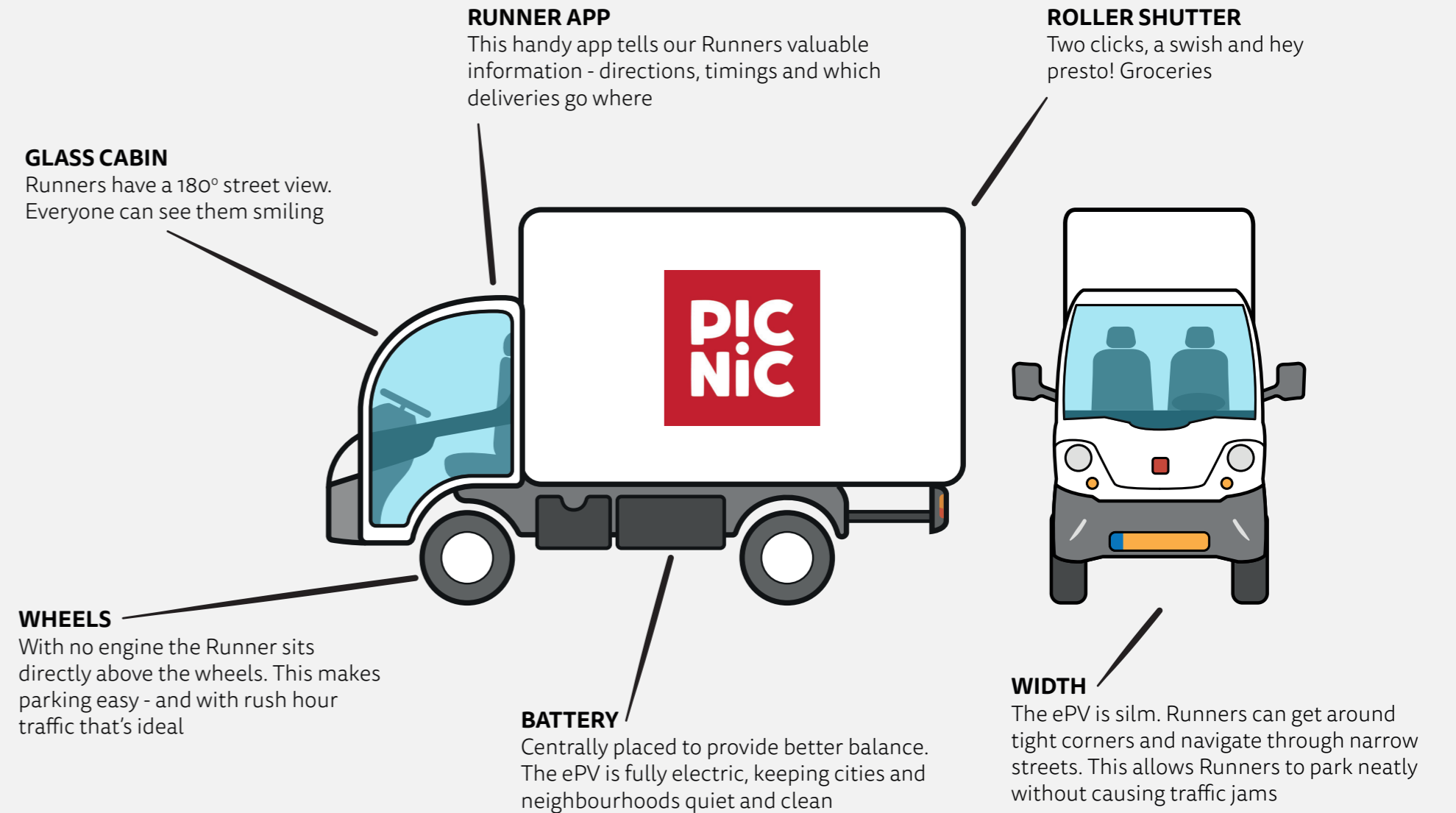
Image 3:
The key features of an ePV's design

STAKEHOLDERS

This project has 4 primary stakeholders which can influence this project *[Image 4]*. Secondary stakeholders may become relevant prior to the ideation phase. This project is being conducted on behalf of the Picnic distribution team and thus they are interested in the project findings and conclusion. Research will be obtained from all 4 stakeholders and with testing only involving the Runners.

Picnic distribution team:
The distribution team focuses on the distribution hubs, Hub managers and Runners. The ePV2 is also being designed by this team. Overall they work on safety and efficiency of these hubs. They are highly knowledgeable of the system and thus any data and input they share will affect this project.

Picnic Hub managers:
The hub managers organise the Runners, maintain the hub and its flow of goods. They have daily contact with the Runners, ePV and customer data. With this project focused on the Runners it may have an impact on the Hub managers and will be kept in consideration.

Picnic Runners:
This project is based on the Runner's experience, thus their inputs are valuable.
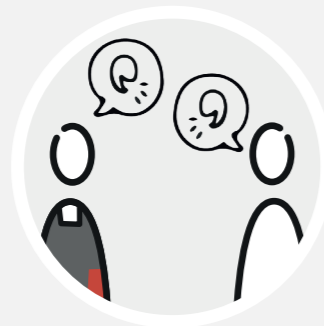
Picnic Customers:
The Runners and the ePVs are the most non-digital contact that the customers have with Picnic. The Runner's appearance and actions can affect the company's public image.

Image 4:
The four project stakeholders

THE RUNNERS

The Runners are Pinic's main labour workforce that ensures the deliveries reach their destinations. Generally 18 to 30 years old, Runners work flexible shifts that are signed up for at the beginning of each week. A day of delivering generally involves 3 afternoon / evening shifts and soon there will be a 4th with the recent introduction of morning shifts. Most Runners will sign up for 3 shifts at a time, for convenience, starting at 2pm and ending around 11pm. A shift can take around 2-3 hours, depending on the intensity of the deliveries. In between shifts Runners get a 30min break to rest, with free food from Picnic.

Runners are managed and organised by their hub managers, who track and record their performance and delivery errors. If a Runner works and is eager to do more they can apply to be a Runner+ who does less deliveries and assists the Hub manager with hub duties.

A Runner's uniform is bright and friendly. It starts with a white collared shirt or polo and blue jeans. They are required to wear steel cap shoes and an apron or red coat if it is cold. A Runner cap is optional and mostly used when raining. Runners have 5 main tools they use during their shifts the; ePV, scanner, trolley, Runner app and delivery sheet. Each of these help the Runner to complete certain tasks that will be elaborated on in the research segment.
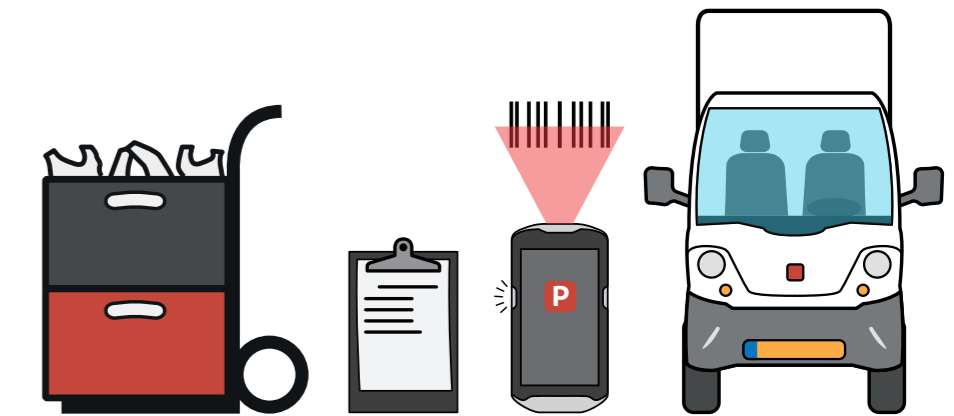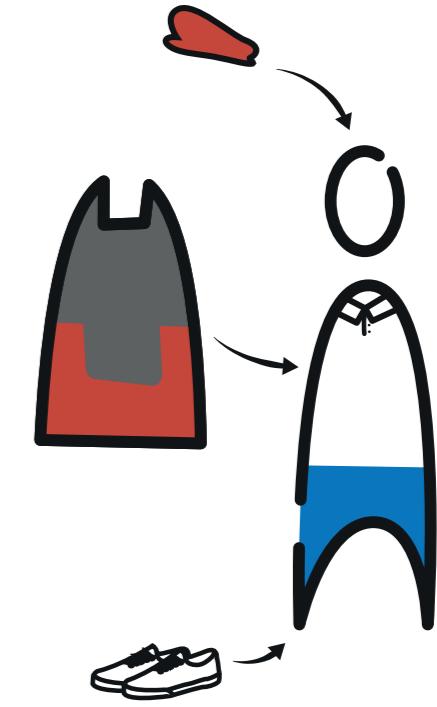
Image 5:
The Runner's uniform, trolley with totes, delivery sheet, scanner and ePV

A Runner with an ePV

RESEARCH

.1

APPROACH

This thesis project will follow two design methods to help direct its progress and development: Design Thinking and Creative Problem Solving. By using both allows for a constant opportunity to refresh the approach taken for this project. However, the main progression of this thesis will follow the stages of Design Thinking: Empathise, Define, Ideate, Prototype, Test.

Design Thinking is an iterative process that focuses on the empathy of the end user *[Image 8]*. It brings together the consideration of the end user and with the practicality of designing a product *(Design Thinking Process", 2019)*.

Creative Problem Solving is a structured approach for generating novel and useful solutions to problems *(Boeijen et al., 2017)*. It uses out-of-the-box thinking to help overcome hurdles that might occur in a project *[Image 7]*.

Empathise will be the research segment, this is where the users are studied and understood to record and explore their interactions, habits and emotions within their context. Afterwards the research will be analysed and the users main pain points and insights will be **Defined** ready to implement into ideas.
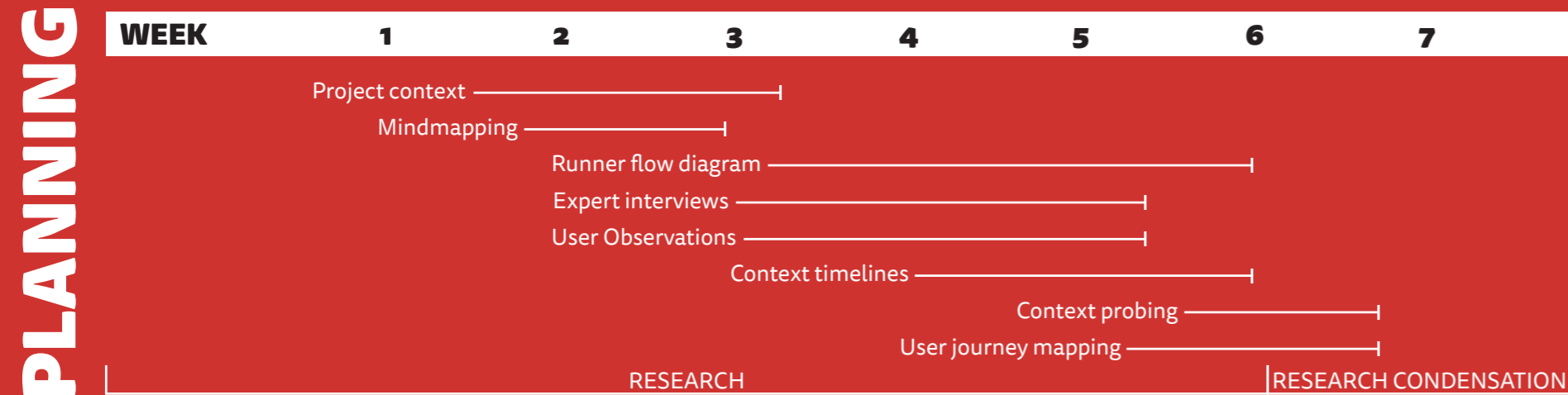
A direction will be chosen from the insights, from this **Ideation** will occur, creating concepts that will be **Prototyped** and **Tested** multiple times. Eventually ending with a product.

To help spur the research forwards, some research questions were formulated:

RQ1:   What happens during a Runner's shift?
RQ2:   How do Runners feel about their job?
RQ3:   Do Runners have unique habits?
RQ4:   What Do Runners value the most in their job?

Full project planning in Appx. 2

Image 6:
Research approach

PLANNING

WEEK	1	2	3	4	5	6	7
Project context							
Mindmapping							
Runner flow diagram							
Expert interviews							
User Observations							
Context timelines							
Context probing							
User journey mapping							

RESEARCH   RESEARCH CONDENSATION

CREATIVE PROBLEM SOLVING

OBJECTIVE FINDING

FACT FINDING

PROBLEM FINDING

1. EXPLORE THE CHALLENGE

IDEA FINDING

2. GENERATE IDEAS

SOLUTION FINDING

ACCEPTANCE FINDING
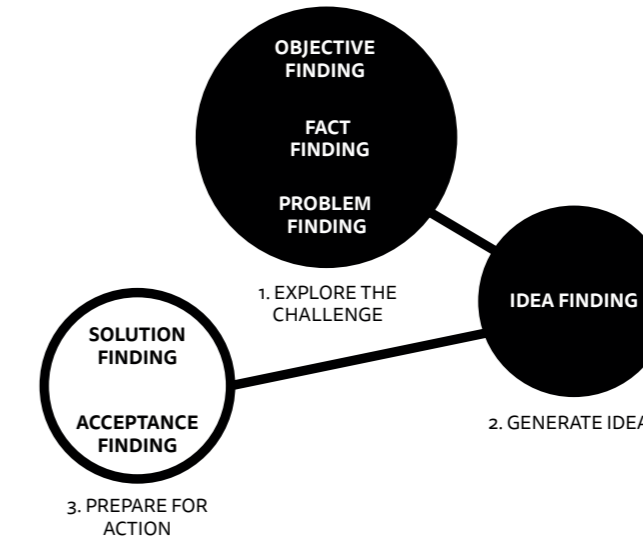
3. PREPARE FOR ACTION

Image 7:
Creative Problem Solving model

DESIGN THINKING
A FRAMEWORK FOR INNOVATION

EMPATHISE
Innovation should be user-centered

IDEATE
Innovation is born from a clash of ideas

CONTEXT   FORM

DEFINE
Innovation should solve a problem

TEST
Innovation should be refined

PROTOTYPE
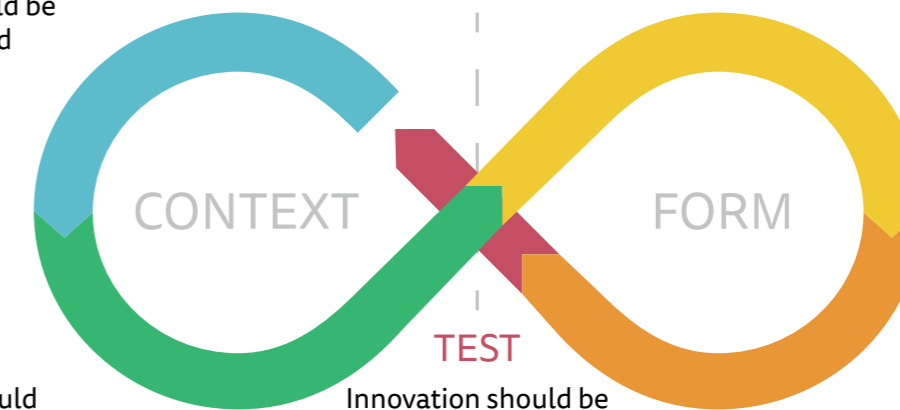Innovation should be brought to life

Image 8:
Design thinking model

RUNNER FLOW DIAGRAM

User flow diagrams are a useful way to visually lay out how a user navigates a system. The target user is the Runners and the flow diagram displays their key moments and tasks during their job. Having done many shifts with Runners during interviews and observations, a solid understanding of their routine was achieved. A Runner's routine is anything but linear with multiple interlocking cycles and optional tasks. The Runner's routine is only known to the distribution team by experience and has never been visually laid out. Each stage is a common task or actions that all Runners do during their day. This includes alternate tasks that are not done as often. Each stage has been given a unique tag, so that this diagram can be used as a communication tool by the distribution team [Image 10]. This thesis will use the same stage labels when referring to a task.

Whilst creating this chart it was noted that there are many extra tasks that may not always occur. These mainly happen in the hub and are done if the Runner wants to work more hours or has spare time after a short shift. From observations on shifts it was noted that locating the address of the customer can be rather repetitive with the Runner driving around the streets looking for house numbers or parking and going by foot to check mailboxes. In the diagram this has been given a small loop to indicate that this is trial and error task. This diagram was shown to multiple Runners and Hub managers to confirm its accuracy.
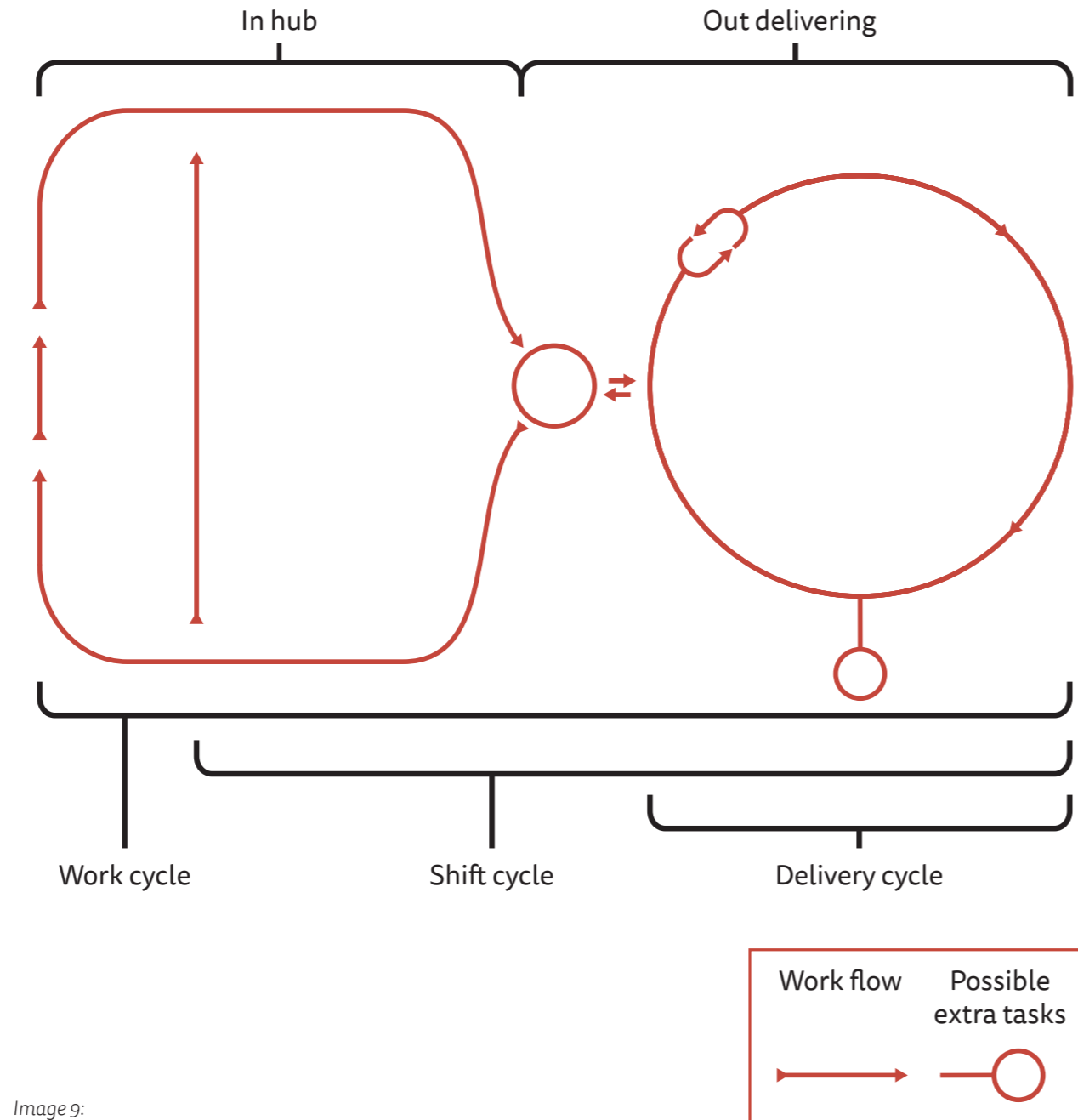

Image 9:
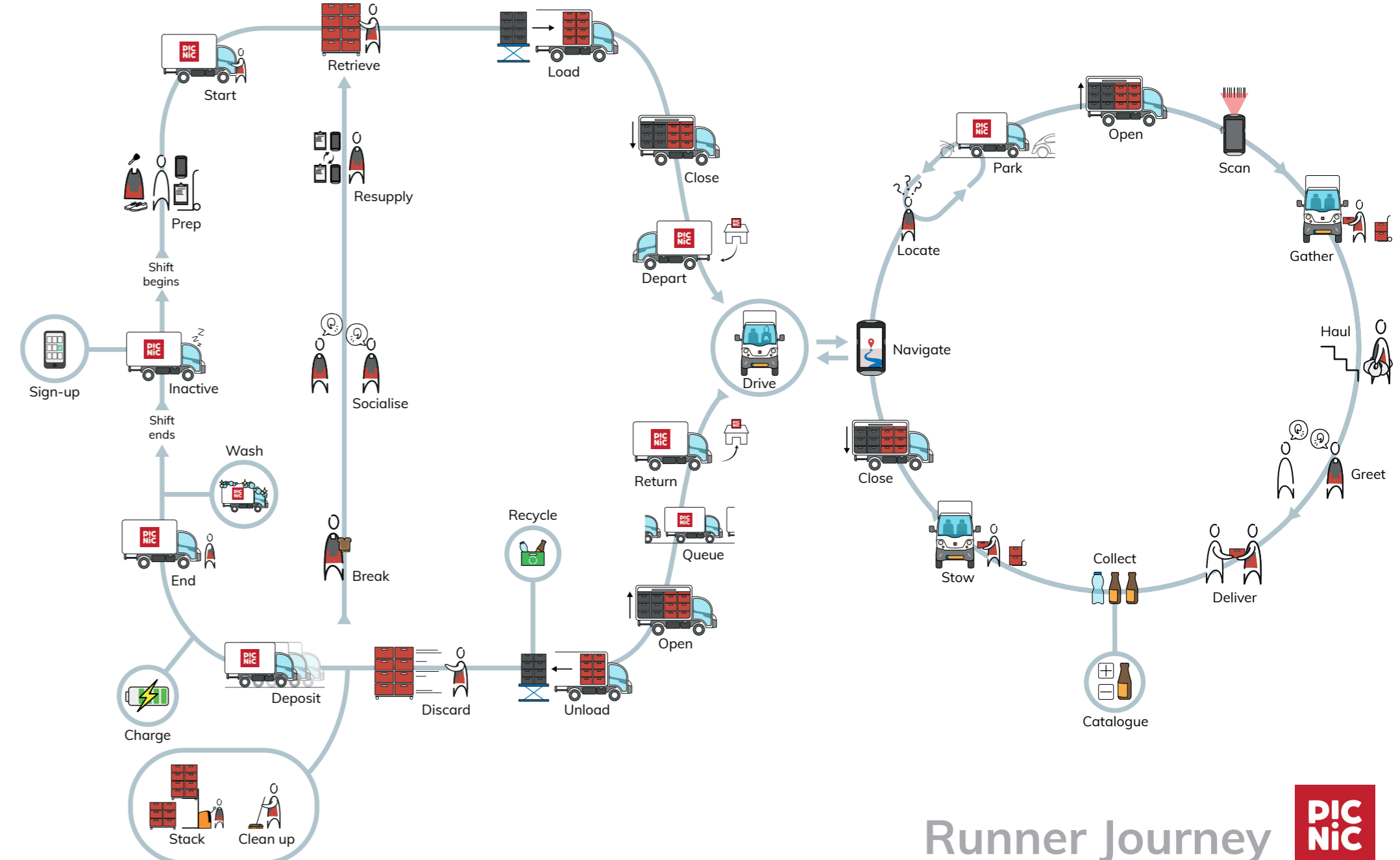*Explanation of Runner Flow Diagram*

Image 10: The Runner Flow Diagram

Runner Journey

MINDMAP

Mindmaps can be used to lay out aspects of a context to build an understanding and to begin identifying issues *(Boeijen et al., 2017)*. Prior to starting interviews and observations a brief mind map was created with a few distribution colleagues in order to outline the factors that occur within the Runner context, although not highly accurate it provides talking points to direct the initial interviews *[Image 11]*. Personal and environmental contexts appeared to have the most factors generated. It begins to indicate that the Runner's job is highly physical with few business and technological touchpoints.

Image 11: Mindmap of contextual factors from the Runner's perspective

EXPERT INTERVIEWS

Expert interviews is a method that allows to gain rich information and insights from the context "expert"; the Runner. Numerous Runners were accompanied on their shifts in multiple Dutch cities. They were interviewed and observed during their shifts, as *(Alshenqeeti, 2014)* suggests that interviewing in user's context provides richer results allowing the user to describe their thought processes during tasks. Over 12 shifts were joined in 6 different distribution hubs with 2 hours per interview. Each hub provided different types of environments that the Runners individually experience on a daily basis, both in Hub and out on delivery. Runners in Amsterdam deal with more narrow staircases and traffic than those in suburbs such as Amersfoort. And smaller hubs tend to have a family style community like in Gouda, whilst others, similar to Den Haag with over 150 Runners can often be socially overwhelming. The interviews were done anonymously within the company schedule. Notes, thoughts, statements and insights were recorded by both notebook and voice recorder.

The initial interviews were done to improve context understanding how the job functions, with questions based on the mind map factors. In later interviews topics mentioned by previous Runners were used as discussion points for more detailed responses. The interviews started with an introduction about the project and how their input will be used. After the first delivery the conversation began to follow the Path of Expression model *(Sanders and Stappers, 2014)*; talking about their current and past experiences and what they want it to be, to keep a progressive conversation that yields valuable results. The interviews were followed by observations and generative sessions to gain a deeper knowledge insight into the user as proposed by the Say, Do, Make method *(Sanders and Stappers, 2014)*. Full interview notes in Appx. 3

PATH OF EXPRESSION

Make the user aware by thinking of the present, then the past in order to look forward to the future
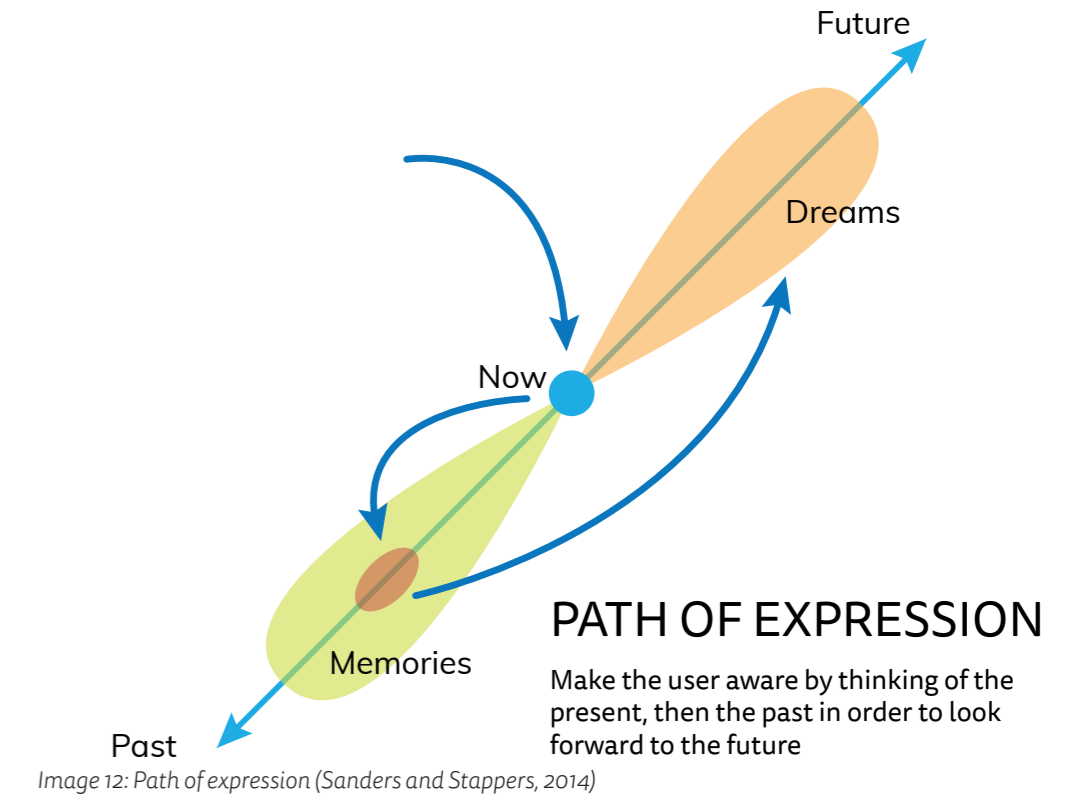
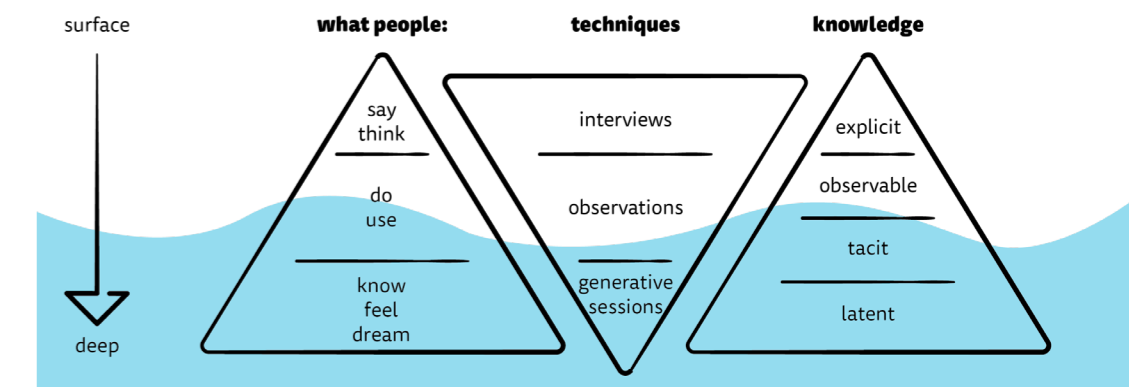Image 12: Path of expression (Sanders and Stappers, 2014)

Image 13: Say, do, make method (Sanders and Stappers, 2014)

Image 14: A Runner talking about how she dislikes heavy and large deliveries

Image 15: Hubs where interviews and observations were conducted

OBSERVATIONS

User observations *(Boeijen et al., 2017)* were conducted alongside the interview during the Runner's shifts. From these sessions I was looking for habits that have evolved to overcome common difficult tasks, as well as habits that differ between Runners and locations. Two approaches were taken for a variation in observations; one done in person, the other via a GoPro mounted to the vehicle. The observations done in person allowed for verbal comments by the Runner on the reasoning for their actions. The GoPro gave an unobtrusive perspective into how the Runner functions naturally, without having a passenger or being distracted by an interviewer.

User observations

Due to my unfamiliarity with the Runner's job, many moments stood out as unusual compared to how I would assume they should be. Findings included:

- Black totes have broken foam grips and with heavy contents can be very difficult to remove from the frame. An uncomfortable pinching is needed to pull it out *[Image 16]*.

- Once scanned by the Runner app the Runner partially pulls out the tote to indicate which totes are part of the delivery *[Image 18]*.

- The Runner used themselves and the cargo box to rest the totes and organise everything before being hauled to the customer. Also this Runner wears gloves due to the sharp metal on the frames *[Image 19]*.

Image 16:
Runner struggles to pull out black totes

Image 18:
Runner's pull put scanned totes

Image 19:
Runner rests totes during gathering

GoPro Observations

The Runner's actions and habits were observed during a shift where Three GoPro sessions were conducted, with the camera placed in various places, obtaining a range of perspectives on the Runner *[Images 21,20]*. The camera had a limited battery of one hour, which restricted the amount of data that could have been collected from a 2 hour shift.

Additionally due to the compactness of the vehicle it was difficult to find a perspective that captured more than one area of interest. For example, the camera on the rear of the cargo box only managed to capture 3 out of 6 deliveries that occurred during the first hour because it was only able to capture one side of the cargo unit. The participants were randomly asked to be filmed and were recorded if they agreed.

Many observations from the GoPro were similar to those found via user observations, however they did show a few new interesting points:

- Over the hour footage of the Runner driving (interior cabin perspective); there were many distractions with the Runner sheet and user's phone (for music)being 52% of these.
- Without the interviewer the Runners use the spare seat to hold personal belongings or the trolley, which during the interviews was kept behind the passenger seat.
- Runners were seen getting out of their vehicle before delivering to locate house numbers.
- Runners value the freedom of driving, especially when playing their music

Notes and photos from interviews and observations can be found in Appx. 3-5

Image 20: GoPro placement in 2nd session

Image 21: Three views obtained from the GoPro recordings

Runner haul types

From the observation it was noted that each Runner has a preference in how they like to haul the delivery to the customers door. They are provided with the produce pre packed in plastic bags which are inside of the totes and a trolley if they want to use it. 4 types of users were observed: Bag, Tote, Hybrid and Trolley users *[Images 22]*.

- Bag, users take no totes and tend to have sore hands. This is commonly used in areas that have lots of narrow staircases. Deliveries are often taken in one trip, with the Runner refusing to do all those stairs twice.
- Tote, users tend to take no more than two stacked in hand. The bags are taken out once delivered.
- Hybrid, users take the produce from additional totes and are often packed into one. Hybrids can often become Tote only users when there is too much product for one tote, or they will do 2 trips.
- Trolley, is used when there is a large delivery or a long distance to walk in buildings or down alleys. Using the trolley can often cause more effort than it seems.

Visual alterations

The original Runner sheet is full of text and does not use many icons for infographic. However, the Runner can find all the information they need about the deliveries from this sheet. It was observed that before the Runners depart on their deliveries they often study their Runner sheet and draw upon it. There is even a similarity amongst Runners as to the symbols they use. Image 23 shows the types of symbols they draw and the information they gain from the added visuals.
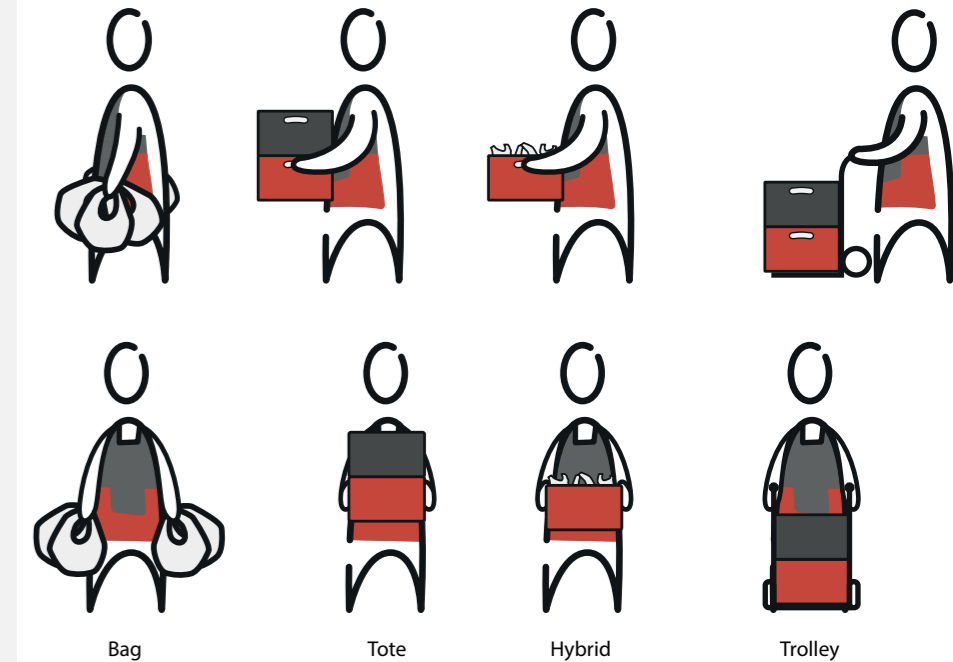

Bag   Tote   Hybrid   Trolley

Image 22: Runner haul types

Images 23: Visual drawings Runners add to the Runner sheet

CONTEXT TIMELINES

Context timelines help to show which events the users values or recognised within their schedule. Additionally it reveals how they emotionally perceive a task from an external perspective. The Runners were asked to complete the timeline sheets inbetween their shifts *[Image 24]*. This method style is taken from the Convivial Toolkit *(Sanders & Stappers, 2014)* and is used to reach the bottom of the Say, Do, Make pyramids. Visual trigger sets were not used due to the limited time the Runner's had available to complete the task. The semi rushed nature of this activity may have limited how expressive the participants could

have been.
The participants were asked to complete the following steps on the line provided:

1. Use the line to show how you spend your time during your Runner shift. Describe all the tasks and moments on the timeline below.

2. Use the colour pens to mark your positive and negative emotions that happen throughout the shift.

3. Place the stickers where you felt the happiest and the most annoyed.

A total of 8 timelines were completed by Runners of varying ages and genders *[Image 25]. Full timelines in Appx. 6*
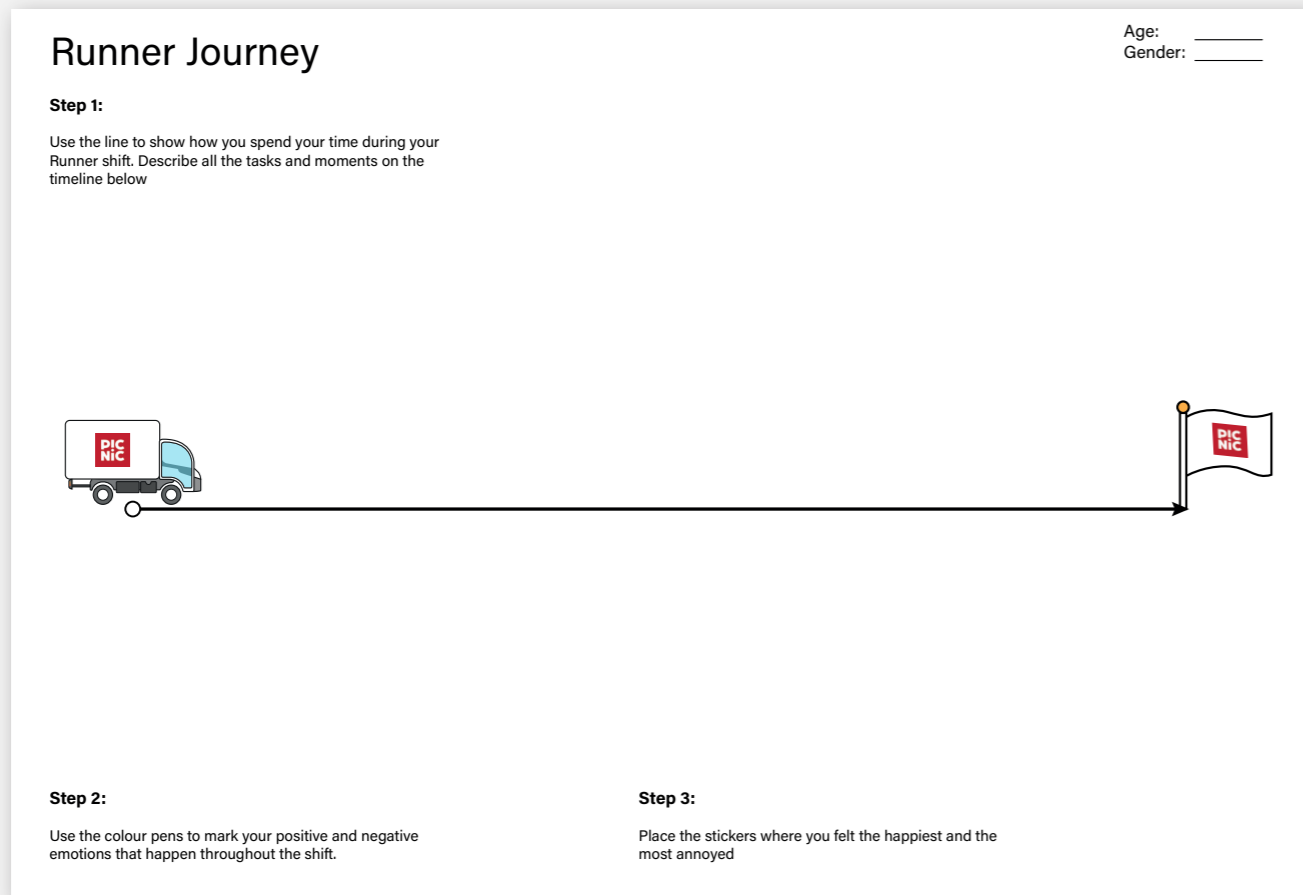

*Image 24:
Context timelines
template*

*Image 25:
Completed
context timelines*

CONTEXT PROBING

An adaptation of Cultural probing *(Boeijen et al., 2017)*, Context probing involves using a probe to explore the context and gain results that give insights from the users perspective without a designer nearby. For this project a disposable camera with a note sheet was given to a Runner to use for a week *[Image 26]*. They were asked to take photos of the best and worst aspects of their job and note down their mood on the sheet for each photo. With the camera only containing 27 shots, the Runner needs to ensure that each photo is meaningful. From the 27 photos, only 9 turned out well, the rest were of poor quality or unrecognisable *[Image 28]*.

From the images that were retrieved, it can be derived that the Runners highly value their social time and the pizza. The remaining photos show a black tote that has broken handles and strawberries

that have fallen out of their container. Black totes are a common problem and have already been set to be resolved for the ePV2 cargo, whilst the packaging issues are noted by the Runner+ and often resolved the next day. A second camera was sent out in an attempt for more insights, but it did not return.

Image 27: Negatives from the disposable camera

Image 26: The disposable camera that was given to Runners

Image 28: The 9 photos taken by the Runner

USER JOURNEY MAP

An interpretation of the Customer Journey method *(Boeijen et al., 2017)*, was used to create a visual overview of research findings. The questions that are usually asked during this method are instead pre-answered from the finding of the previously used methods. The Runner Flow chart has been converted to fit a linear flow and the findings for each stage are displayed below. The data in the rows: key items, user action, goals and notes are taken from; interviews and observations, with the emotions chart being derived from interviews and context timelines. The whole
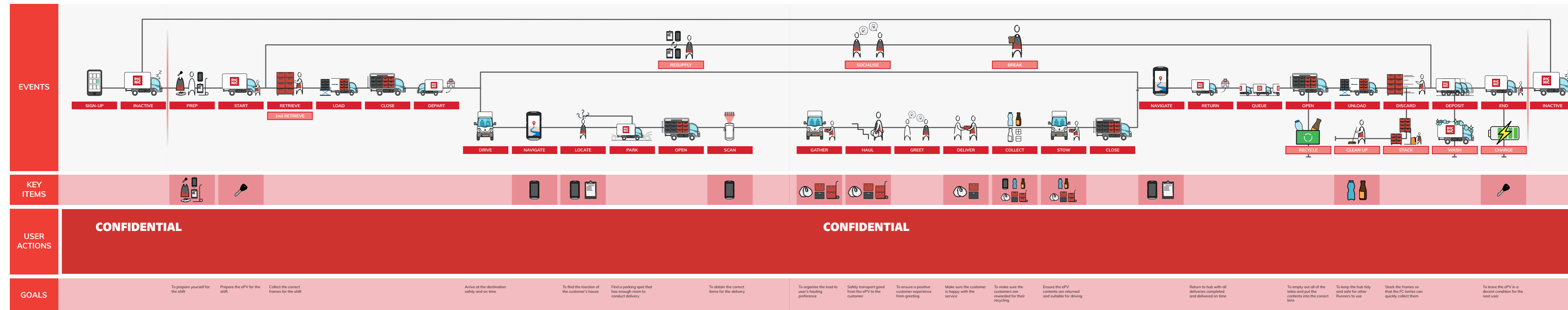
Journey map poster spans 1x3m and is displayed in the Picnic office for the distribution team to use as a source of knowledge for further improvement. In this report it is split over four pages due to its size. This map is a condensation of the research findings. Only the most interesting findings will be discussed.

From a glance it can be seen that the delivery cycle of the routine is the most intensive, with many tools used and actions to be completed.

It provides a rich area for insights with the majority of them being found there. For the Runners this cycle is the most familiar to them as they have expressed it as the main part of their job. Between leaving the hub and returning the Runner experiences the largest fluctuation of emotions, this based on their reflection after shifts. Reasonings for these emotions were drawn from user observation and interviews. Interesting statements from the Runners are located in Notes row in bold. For rows with doubled events the sub-event is outlined separately. General finding, involving topics outside of shifts are noted at the

beginning of the flow under the sign up phase. These include issues involving gender disparity and salaries.

Image 29: The top half of the Runner Jounrey Map poster

EVENTS

SIGN-UP · INACTIVE · PREP · START · RETRIEVE · 2nd RETRIEVE · LOAD · CLOSE · DEPART · RESUPPLY · SOCIALISE · BREAK · DRIVE · NAVIGATE · LOCATE · PARK · OPEN · SCAN · GATHER · HAUL · GREET · DELIVER · COLLECT · STOW · CLOSE · NAVIGATE · RETURN · QUEUE · OPEN · UNLOAD · DISCARD · DEPOSIT · END · INACTIVE · RECYCLE · CLEAN UP · STACK · WASH · CHARGE

KEY ITEMS

USER ACTIONS

CONFIDENTIAL

CONFIDENTIAL

GOALS

To prepare yourself for and the shift | Prepare the ePV for the shift | Collect the correct frames for the shift | Arrive at the destination safely and on time | To find the loaction of the customer's house | Find a parking spot that has enough room to conduct delivery | To obtain the correct items for the delivery | To organise the load to user's hauling preference | Safely transport good from the ePV to the customer | To ensure a positive customer experience from greeting | Make sure the customer is happy with the service | To make sure the customers are rewarded for their recycling | Ensure the ePV contents are returned and suitable for driving | Return to hub with all deliveries completed and delivered on time | To empty out all of the totes and put the contents into the correct bins | To keep the hub tidy and safe for other Runners to use | Stack the frames so that the FC lorries can quickly collect them | To leave the ePV in a decent condition for the next user

Runner Research

31

Whilst studying the result of the emotions it is noted that there are 3 main mood peaks during the day; driving, break time and going home. The lowest mood troughs are; the 2nd retrieval, hauling and clean up. Hauling and cleaning up are the most labour intensive parts of the job whilst the 2nd retrieval indicates the end of break and start or 2nd shift. For most this causes an arduous feeling without any physical effort used. But what is unusual about these low mood points is that the Runners indicated that the worst part of the day occurs elsewhere; at the beginning of the daily job. This is best described as the monday morning feeling, where the dread of the effort ahead is realised. *Magnified view of User Journey Poster in Appx. 7*

RESEARCH REFLECTION

The language barrier was a big limitation to the research as there were users who I could not interview as Runners are not required to speak English, this not only limited the user pool, but also restricted the use of vocabulary for a user to describe their thoughts and emotions during interviews. Due to the complexity of Picnic's system it provided many unknowns and knowledge gaps, thus making it hard to fully plan questions for interview and where to focus certain methods, which is why many methods were used to canvas the whole job. If the research was to be repeated, there would be more effort put into forming connections with Runners who have them involved consistently in the project process.

From the research there were many findings that allow for improvement opportunities for the user experience. These findings cover many topics, they include notable problems, habits and insights to the Runner experience. For a company as young as Picnic it is very impressive to see such a complex logistic system functioning so fluidly, and now that it is at a functioning state, they can begin to focus on improving the experience of the Runners. This project has provided Picnic with an in depth evaluation of what can be improved for the Runners.

Image 30: The bottom half of the Runner Jounrey Map poster
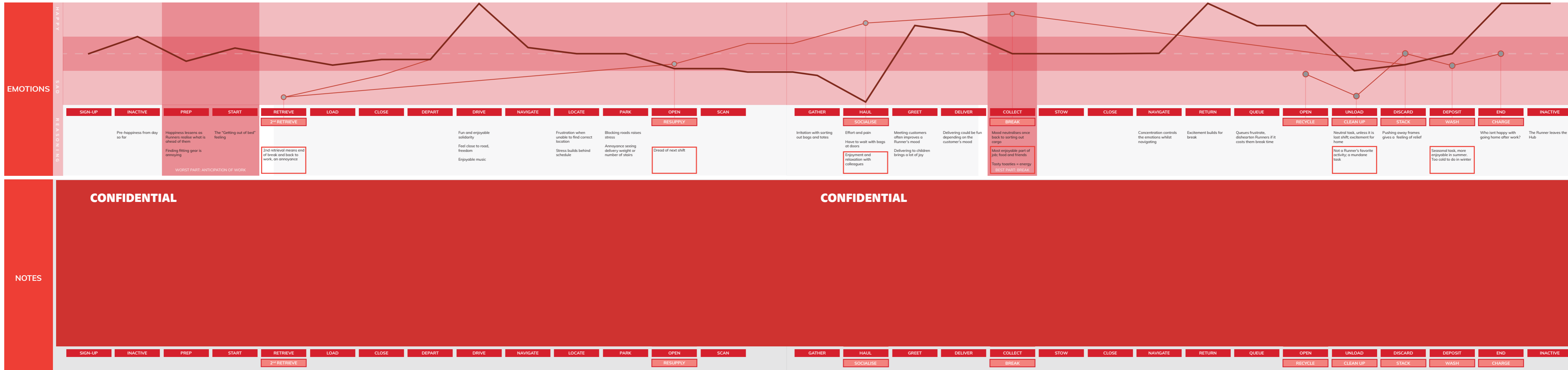
RESEARCH QUESTIONS REVISED

From the research, it is safe to say that the research questions stated at the beginning of the project have been answered by the methods conducted.

RQ1: What happens during a Runner's shift?
      The Runner flow diagram provided a visual representation of the ongoings of a Runner's shift. It is a fairly repetitive system with multiple cycles. The shift has a clear backbone of tasks with additional tasks that occur infrequently. The job itself is mostly individual with other Runner contact in the Hub and customer contact during deliveries. Runner's rarely see the same customer twice in a month.

RQ2: How do Runners feel about their job?
      Context timeline provided a foundation that was elaborated on by the expressions from interviews and laid out in detail in the user journey map. The job, like all jobs, has its highs and lows with the majority of hub work being mundane. Laborious work is least liked and often dreaded. Other emotions were mentioned such as; fear when delivering on the roadside, pride to be a female Runner, disappointment of other Runners who drive recklessly, etc.

RQ3: Do Runners have unique habits?
      Observations and interviews gave a unique insight to how the Runner's job can differ between individuals. Not all users follow the book and carve their own habits to make tasks either easier or more efficient. Runners have mixed priorities and most will often sacrifice safety for speed to achieve a longer break at the Hub. There was a distinct change in behaviour of the filmed Runner vs the Runner observed in person, as they felt less judged and more relaxed to cut corners.

RQ4: What do Runners value the most in their job?
      When asked directly a user cannot often think what they value instantly and can take an indirect approach to discover these values. This is what context timeline and context probing achieved. Probing a context can give bold visual statements about their values. In this case it was the job's social side, this is reinforced by the fact that every context timeline mentioned the breaks. A valued time of day can be derived by the frequency it is mentioned amongst Runner's in the timeline, alongside a positive emotion. All Runners noted putting on safety shoes but with a frustrated expression, whilst driving was always written with high positivity.
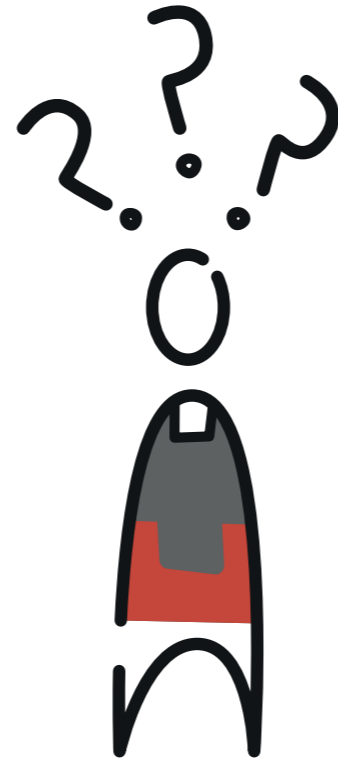
Runners collecting frames for loading

Runners in Haarlem

.2   RESEARCH CONDENSATION

FINDINGS

In the first project phase a large range of methods were used and each one generated plenty of data. In this segment this data will be condensed into important facts and insights to find a direction that will spark the ideation phase.

Findings that lack opportunity weight will be filtered out, such as more leg room needed, as the solution is instantly recognisable and provides little room for exploration. Facts about the process will also be put aside, but will still be considered for reference. Some notes will be overlooked since the problems have already been addressed and designed for in the on going ePV2 project. Once a collection of insights have been made, their relations and desirability will be explored via creative session and discussion with stakeholders.

THEMES

From the first hand experience of the research sessions some themes kept on cropping up and can be seen in the research data obtained *[Image 31]*. By identifying these themes the research findings that don't match the project scope can be ignored. For instance the politics of the Runner's job is not part of the vehicle design.

Runner preferences are based on their way of completing set tasks and their attitude towards the job in general, both physically and emotionally. These also include comfort.

Safety throughout the whole job, whether it's the Runner or the public who are in danger.

Client interaction both directly during delivery and indirectly via representation of the company.

Picnic politics refers to notes involving shift hours, training, gender equality and salary.
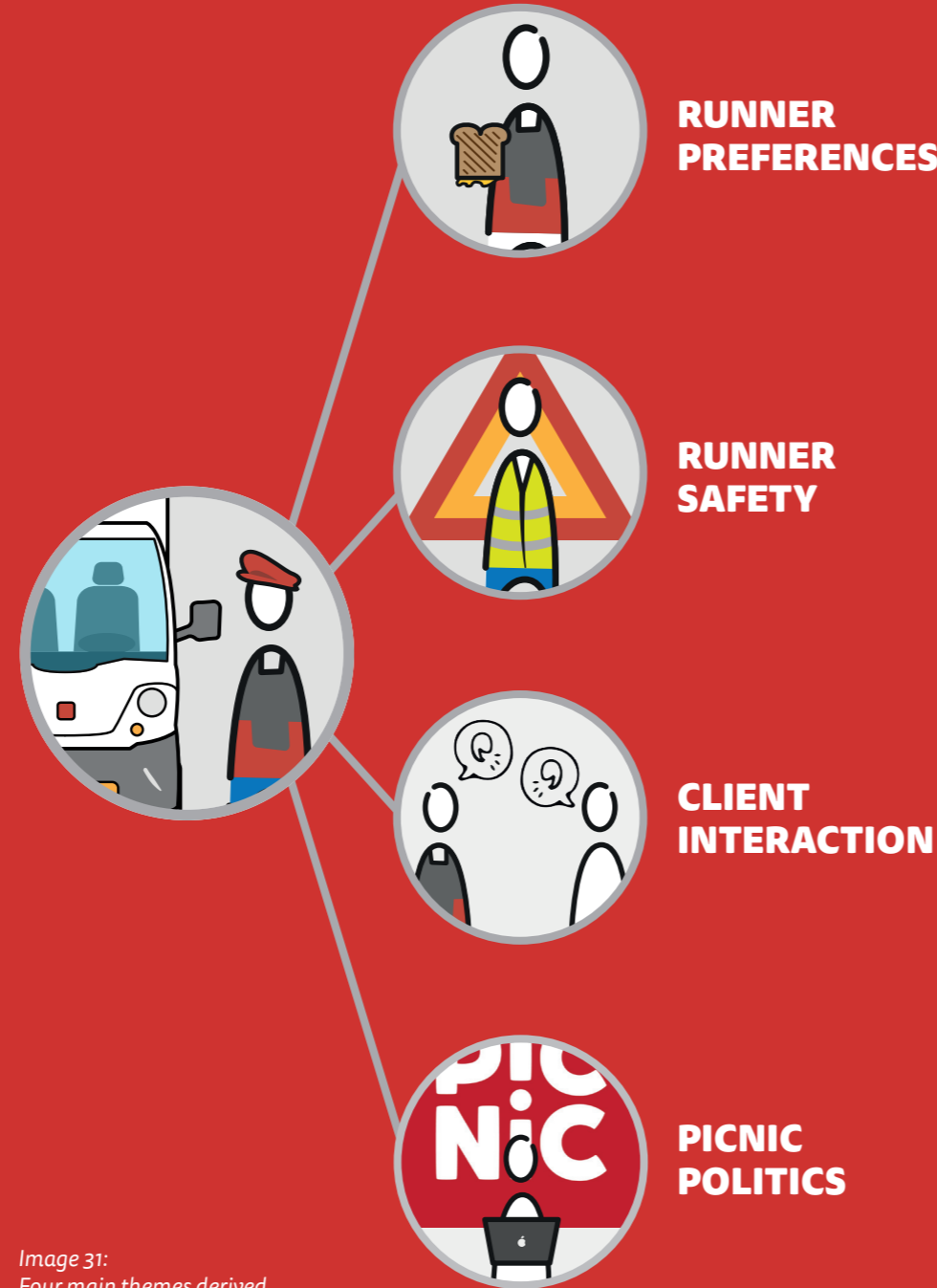
How the insights relate to the themes: Appx 9.

Image 31:
Four main themes derived
from research notes

RUNNER PREFERENCES

RUNNER SAFETY

CLIENT INTERACTION

PICNIC POLITICS

INSIGHTS

In this thesis insights are defined as notes that have been refined to inspire thoughts and questions about the topic it represents. These inspirations will in turn assist the ideation process. Insights are also used as a clear condensed way to communicate the main research point to stakeholders. The research notes were refined into insights twice and both versions can be viewed in *Appx. 8*. Each insight was created from the research notes and reworded to cover at least two of the following criteria *(Medium, 2019)*:

1. Is it inspiring?
Does it make you want to design something to solve the problem you've identified?

2. Does it have a story?
When you explain the insight do you use a compelling user story to bring it to life?

3. Something new?
Is it something that surprised you when you first discovered it?

4. Will it impact on design?
Will it have an effect on your design and thinking

5. Is it relevant to your brief?
Is it related to the space that your client is investigating?

Image 32: Inside the Amsterdam West (AMW) hub

Image 33:
Creative session with colleagues

CREATIVE SESSION

A creative session was held with colleagues, in which they were presented with all the insights and asked to arrange them into clusters or categories *[Image 33]*. The purpose of this exercise was to gain an external opinion on the insights and what they mean to someone else. The insights were arranged into categories of relations of their choice. The participants finished with 8 categories for the 33 insights, with one outlier that couldn't be placed. None of these categories intersected even though there were debates on where some belong.

After completing the insight cluster the participants were asked to rearrange the insights again but attempt to use two axes to express the relations. They decided that the axes should represent the two main focuses of the project; the Runner and the ePV. With each axis representing the relevance of the insight to the focus. A summary diagram was made and clusters formed that were held by an indirect relation to each other. This axis format gives a clear understanding as to what vehicle insights, that if acted upon, will also affect the Runners, meeting both targets of the project scope

Creative session results & photos: Appx 10.

STAKEHOLDERS INPUT

The insights were presented to the key distribution team stakeholders to gain their input on which insight interest them the most and has the most potential *[Image 34]*. Without being asked to they decided to arrange the insight into a spectrum of most inspiring to least inspiring. The inspiration is based on what they thought was an important topic to tackle for the Runners and the development of the ePV2.

The first insight arrangement was discussed that many of the insights involve emotions whilst others focused more on the job practicalities, and they soon found that the insights could be organised into operational vs psychological. Instead of a spectrum they tried to make sure each was this or that, with nothing settling in the center. The second arrangement catalysed a means for the ideation approach, either its a design for:

the **psychological** with **respect** to the **operational** factors

or

an **operational** product that **considered** the **psychological** insights.

The latter was decided upon as it gave the project a greater value to Picnic with a tangible solution that will most likely be implementable into the ePV2. *Stakeholder input session result photos: Appx 11.*

Image 34:
Stakeholders discussing insights

CHOOSING A DIRECTION

From the creative session and the stakeholder inputs the valued insights were identified and ordered *[Image 35]*. Some of the insights were overlooked as this project is focused on the Runners and the ePV, these include customer interaction and political insights. These tertiary insights won't be fully disregarded and may still be referred back to. This focused view on the insights combined with the input from the stakeholders will be used to formulate the design statement. The statement will provide a goal and direction for the development of the design.

From what was found and experienced during the research phase, I believe there is a definite need to improve the Runner's safety whilst working around the ePV. I see the most potential in the area of the Runners safety; considering the amount of data distraction, environment visibility of interior and exterior. The design should maintain a publicly friendly appearance based on the secondary insights. From the interviews there were numerous statements that indicated that the Runners often worry about accidents which could occur to them or to others:

"I don't like delivering on the road side when its dark, the taxi drivers go past very close and fast"

"I need to be extra cautious when driving near people, the vehicle is quiet and people don't hear me"

"If I can't see totes or houses in winter shifts. I don't think other drivers can see me!"

Image 35:
Priority of insights
towards design statement

THE DESIGN STATEMENT:

I WANT TO **IMPROVE** THE **RUNNER'S SAFETY** DURING A SHIFT VIA A PRODUCT, THUS BOOSTING THEIR WORK **EXPERIENCE**.

Inactive ePVs

Runners loading an ePV

.3

IDEATION

TOPICAL RESEARCH

Picnic is ever eager to improve the safety within their logistical systems to prevent unexpected harm to their employees and damage to property. This section will briefly outline the key safety pain points of ePV and Runner safety. Since the user is an important focus, previous notes gained during interviews and observations will be reviewed to understand when safety is an issue in their shift. A system such as the one Picnic uses has a multitude of variables that are constantly exposed to external factors and can be very difficult to predict some solutions before they happen. Many can be predicted and prevented, whilst some will be combatted once brought to light after occurring.

Observed safety issues
From the research phase the following points relate to the Runners safety during their shifts:

Driving
- Items loose inside cabin: phones/bottle/clothes/trolley
- Seatbelt difficult to reach
- Reversing camera blinded by reversing lights at night
- Reversing accidents are the most common due to the unusual turning circle
- Runners struggle to see bicycle lanes when turning
- Distractions whilst driving

Parking
- Runners will get out of vehicle (unparked) to find the correct house number, mostly when dark
- If parked poorly or in middle of road, runners often get confronted by public
- Poor visibility of rear
- Runner sometimes need to check behind the ePV before leaving to check for kids

Gathering

CONFIDENTIAL

Delivering
- Weight and amount of plastic bags hurts runners hands if taken in 1 trip

Image 36:
Lack of illumination on the outside of an ePV

HUB SAFETY

Within hubs there are many moving vehicles and heavy equipment. Here safety is well monitored by the Runner+ and the Hub managers. The hub is similar to a warehouse and has designated areas for walking, vehicles and docking. Safety posters can be found dotted around the hub, there are around 6 to 8 different variations, describing and reminding the Runners of the do's and don'ts of hub operations [Image 37].

From the research Runners mentioned that they are not happy with how younger Runners act in the hubs and believe their attitudes are unsafe and careless. This was common to find in the larger hubs where there are a larger number of Runners to manage per Runner+.

Image 37:
Safety posters displayed around a Hub

TOP 5 RISICO'S

1 Beknelling door frames bij laden en lossen

2 Aanrijding door slecht zicht of niet opletten in de hub

3 Schade door hoogte en dode hoeken van de ePV

4 Gevaarlijke situaties door gedrag van andere weggebruikers

5 Ongelukken door te hoge snelheid in de bocht

GOUDEN REGELS VAN VEILIGHEID

1 Draag altijd je veiligheidsschoenen

2 Rijd op de hub maximaal 5 km/u

3 Ga altijd naast de laadtafel en laadklep staan

4 Voorrang moet je krijgen, niet nemen

5 Weet hoe hoog en lang je ePV is

6 Zorg dat je altijd je veiligheidsgordel om hebt

Let op bij: tunnels en afdakjes

Niet doen!

Stap uit, check je hoogte, rij alleen door als je zeker weet dat het kan!

5 GOUDEN HUB REGELS

1 Draag altijd veiligheidsschoenen

2 Rijd in en rondom de Hub maximaal 5 km/u

3 Ga altijd naast de laadklep en laadtafel staan

4 Loop alleen op de looppaden

5 Help elkaar fouten te voorkomen

ePV blindspots

Many Runners mentioned that they have problems with visibility, not just being seen but also seeing out from the ePV. With curiosity peaked I decided to see exactly what they mean. Using an ePV (G4) and with help from a colleague sitting inside the blindspots were tapped out around the ePV *[Image 39]*. This was done using the ePV1 as the ePV2 development is not at a stage that can allow for speculation of blindspots. The knowledge gained from this exercise, however, can be used to avoid these potholes in the ePV2 design. Two types of zones were tagged; the actual blindspots where an entity cannot be observed from the driver's seat. The other is a partial blindspot in which the driver cannot see items below 40cm (curbs, obstacles, dogs, etc). The partials in this case are produced by the cabins bonnet and A pillars. The holder for the Runner sheet and scanner adds another large blindspot as it is stuck to the windshield, these are used by all Runners *[Image 38]*.

Image 38:
Visual blocks from accessories

Image 39:
Outlined ePV blindspots

Full blindspot
Partial blindspot

Image 40:
Blindspot illustrations
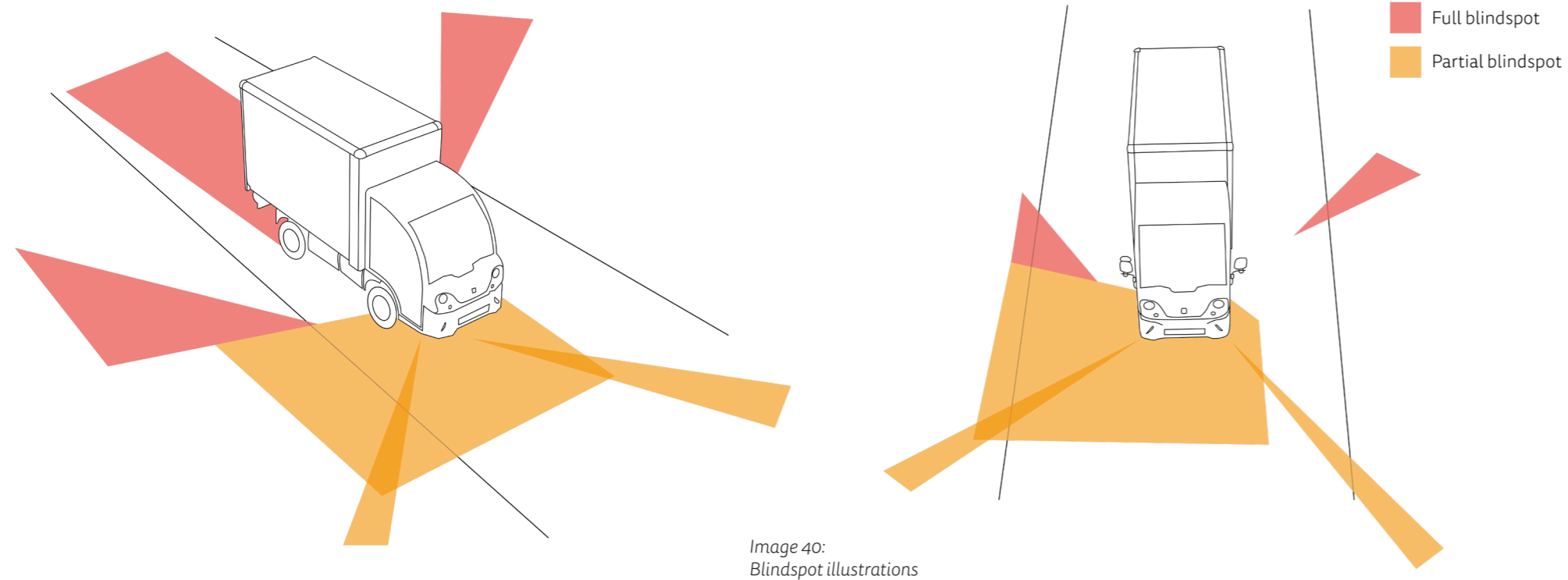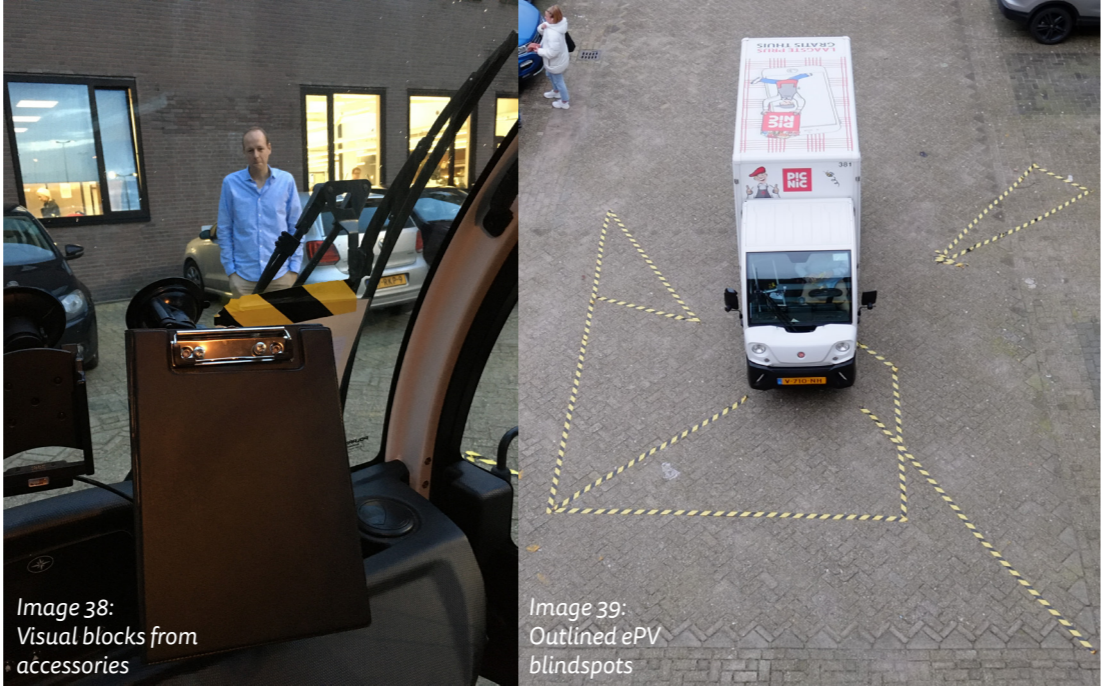
When turning right over bicycle lanes the Runners almost need to shift to the passengers seat in order to see if there are any cyclists coming. This is due to how the cabin sits over the front wheel, many Runners have mentioned that they need to do an extra wide turn to see safely. When a cyclist is traveling alongside this turn manoeuvre they stay within this large blindspot area *[Image 41]*.
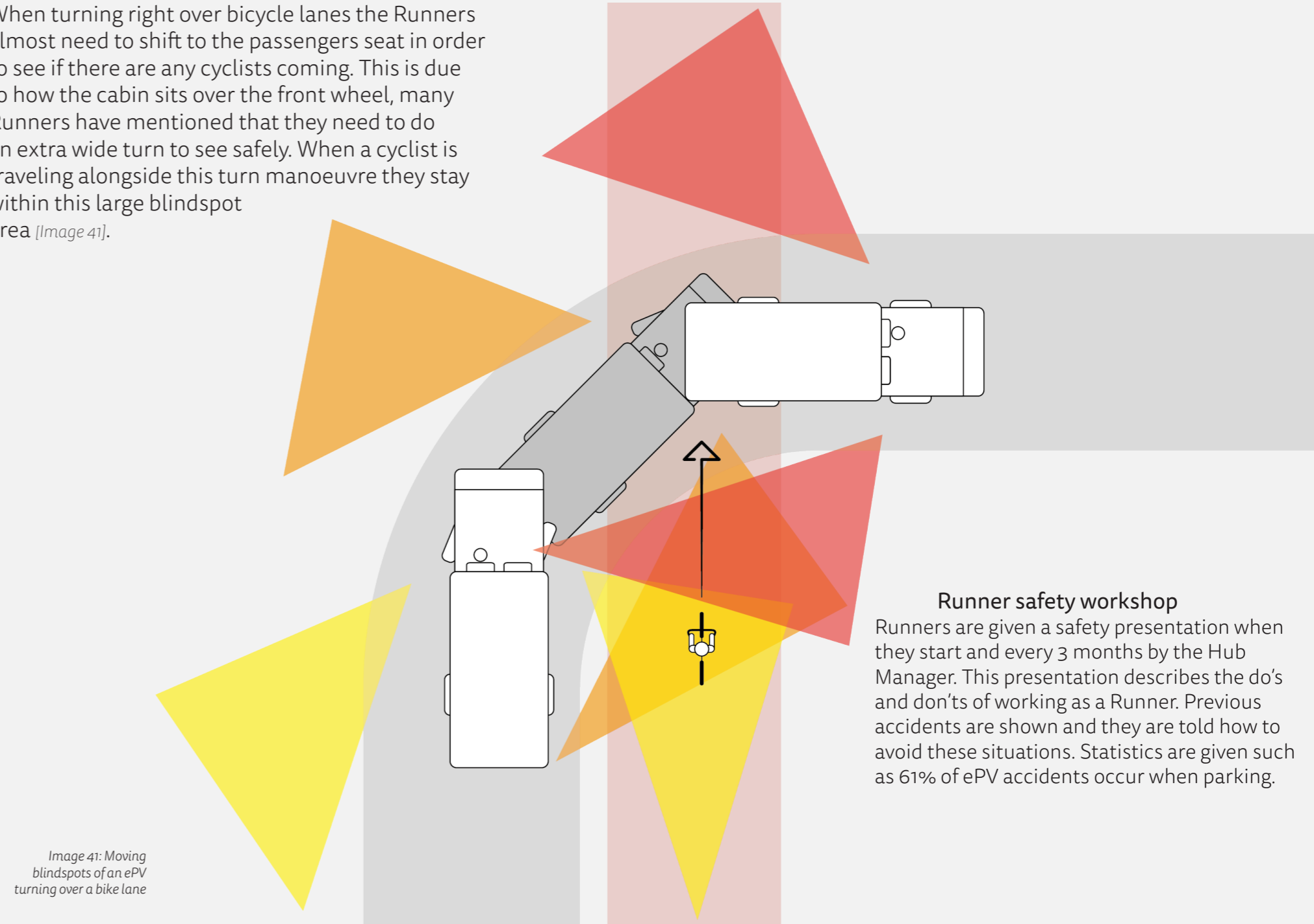
Runner safety workshop

Runners are given a safety presentation when they start and every 3 months by the Hub Manager. This presentation describes the do's and don'ts of working as a Runner. Previous accidents are shown and they are told how to avoid these situations. Statistics are given such as 61% of ePV accidents occur when parking.

Image 41: Moving blindspots of an ePV turning over a bike lane

OUTLINING PICNIC SAFETY

To begin the inspiration for the concept generation the focus, context, domain and the main aspects of safety were defined and written out *[Image 42]*. Overall the main safety aspects that need to be considered were laid out and categorised *[Image 43]*. This gave an overview of which aspects affect or are affected by certain factors.

Prototyping questions were set as a guide that the outcome prototype meets the design statement and project goals:

PQ1. Does the prototype make Runner's feel safer?

PQ2. Does it become safer? (qualitatively)

PQ3. Does the prototype clearly communicate safety?
  i. To runners
  ii. To other road users

PQ4. Does the interaction have an acceptable impact on the droptime (<10 seconds)?
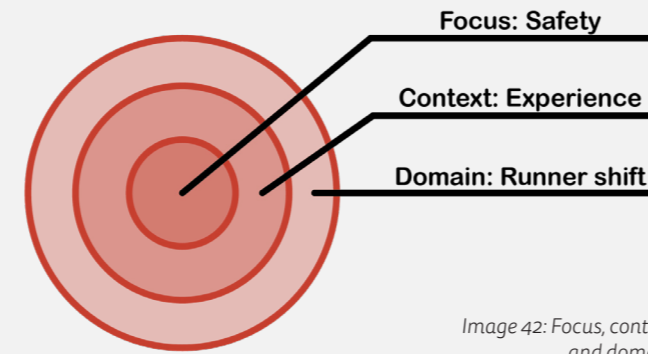
Image 42: Focus, context and domain

Image 43: Safety aspects of context

CONCEPT GENERATION

6-3-5 Creative session

The 6-3-5 method, also known as brainwriting, is used to rapidly create a large amount of ideas within a short period of time *(Boeijen et al., 2017)*. From a design statement or problem each group member is asked to generate 3 ideas in 5 minutes. Once complete the sheets are passed around the group and the next person has to generate 3 more ideas in the next 5 minutes building off the previous users ideas directly or using them as inspiration. With 6 participants 108 ideas can be generated in 35 minutes.

For this creative session there were 7 participants, 6 of which were part of Picnic's creative team and the other the ePV Fleet manager for their expertise input. They were presented with the following problem statement: How can we improve the Runner's safety around the ePV, whilst out on deliveries? Additionally to spice up the idea generation, they were asked to make one unusual or extreme. For example three generated ideas could be:

1	2	3
Give Runners high-vis jackets to be seen at night	Give Runners robo legs to carry heavy totes	Put LEDs on the ePV to illuminate its surroundings
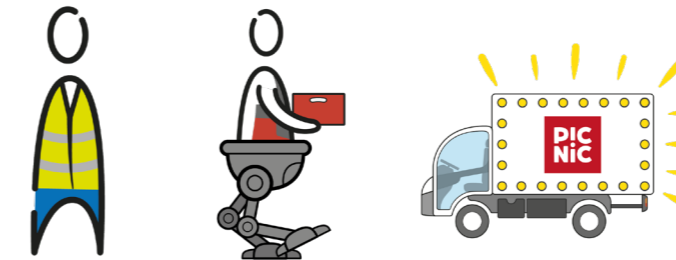
Image 44: Given example of 3 possible ideas

From this session a wide range of 126 ideas were generated. Some ideas were thought of by multiple participants but each iteration ended in individual ideas. The more realistic ideas were sorted into 3 categories; Feasible, Probable and Improbable to be used in the initial concepts. These categories helped to reduce the total number of ideas that can be carried forward as inspiration for the initial concepts. *Generated ideas and idea categories in Appx 13.*
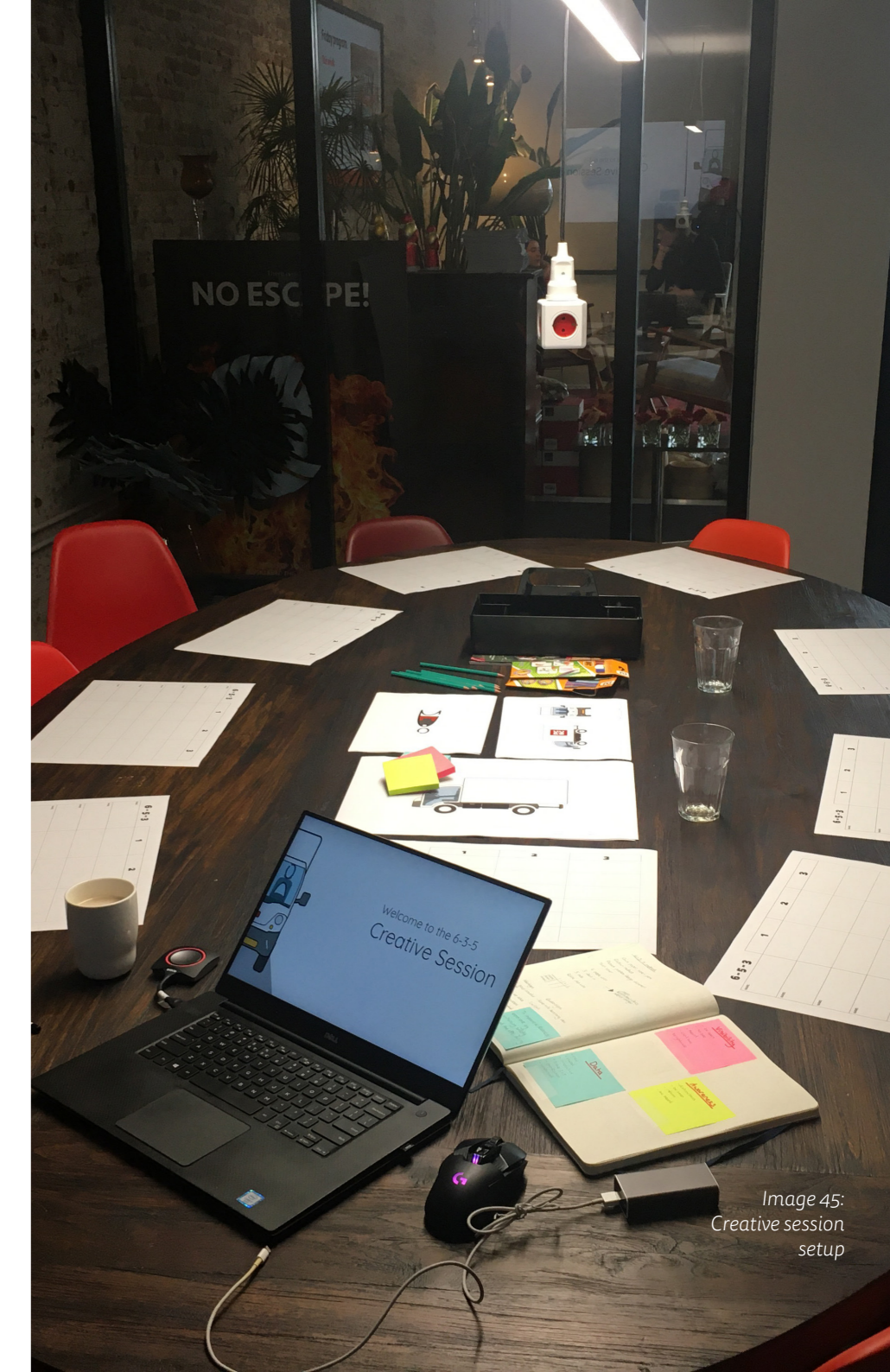

Image 45: Creative session setup

Moodboard

With a range of safety orientated insights and pain points to build concept from a mood board was created to collect creative inspiration *[Image 47]*. Images of interactions and existing products were compiled. Many existing vehicle safety products share similar aspects such as high-vis, and bright colours. The interactions in the board were selected based on personal interest and are not limited by feasibility. The images selection was also lightly shaped by the results from the 6-3-5 creative session.
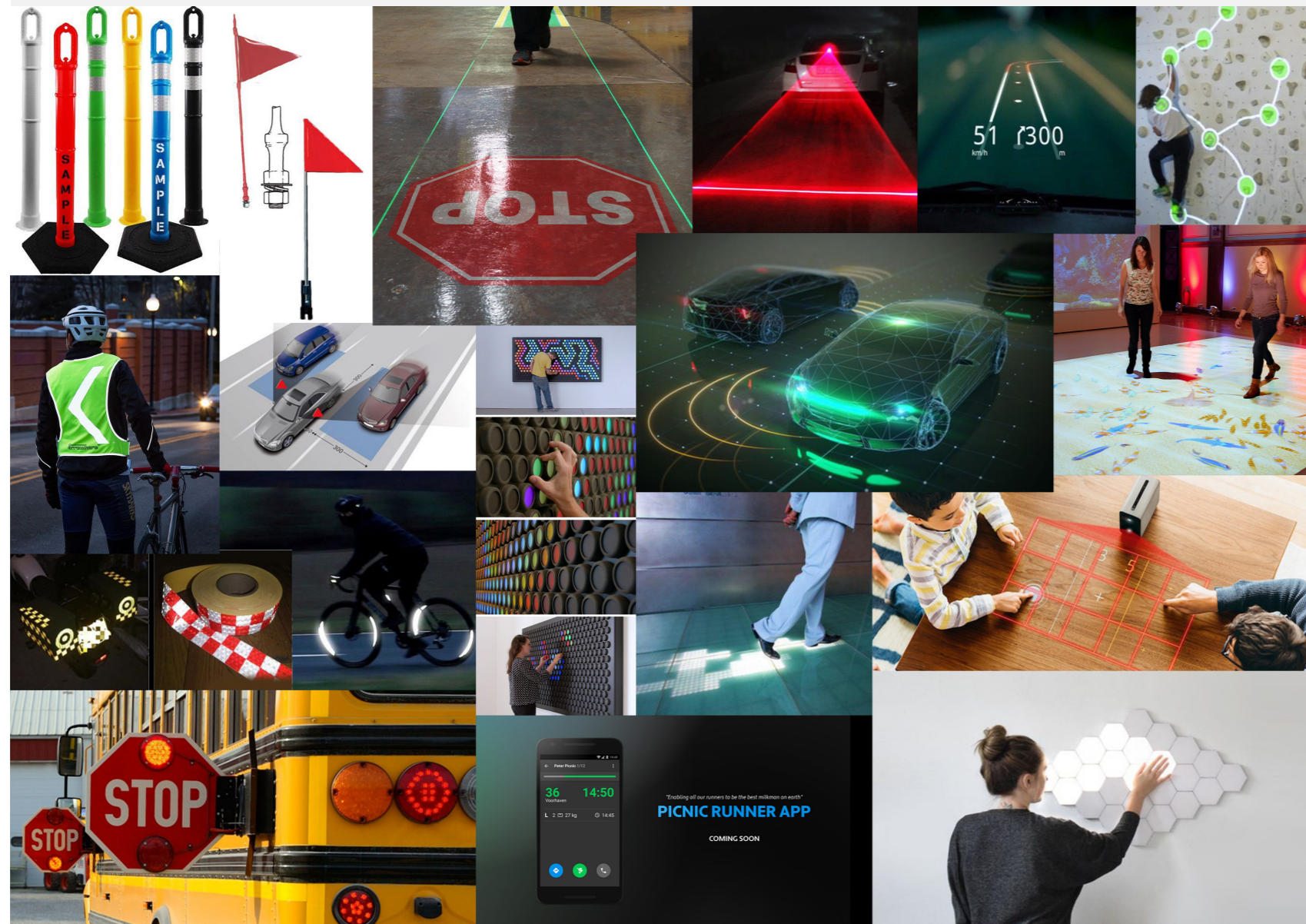
Image 46:
Safety & interaction
Moodboard

INITIAL CONCEPTS

With the prior exploration and knowledge from the research a range of concepts were created that could improve safety for the Runner *[Image 47]*. A few themes were found in the results from the brainwriting; visibility, danger awareness and danger prevention. These themes were used to create a total of 16 initial concepts. The concepts within this range were not all suitable for the needs and wants of the user and Picnic, thus each one was explored and the impact on safety, desirability, feasibility and viability were described in detail. Some concepts were quickly discarded as it was clear that upon initial inspection they had little value in any of the categories. *Full 16 concept explanations in Appx 14.*

1. Reflective totes
2. Tote lift
3. Dynamic lighting
4. Interactive lighting
5. Unsafe marking
6. Runner in distress
7. Static lighting
8. AI spotlight
9. Predicted reversing
10. Customer assistance
11. Tote info clips
12. Signage
13. Cabin HUD
14. High-vis apparel
15. Auto - doors
16. Proximity warnings
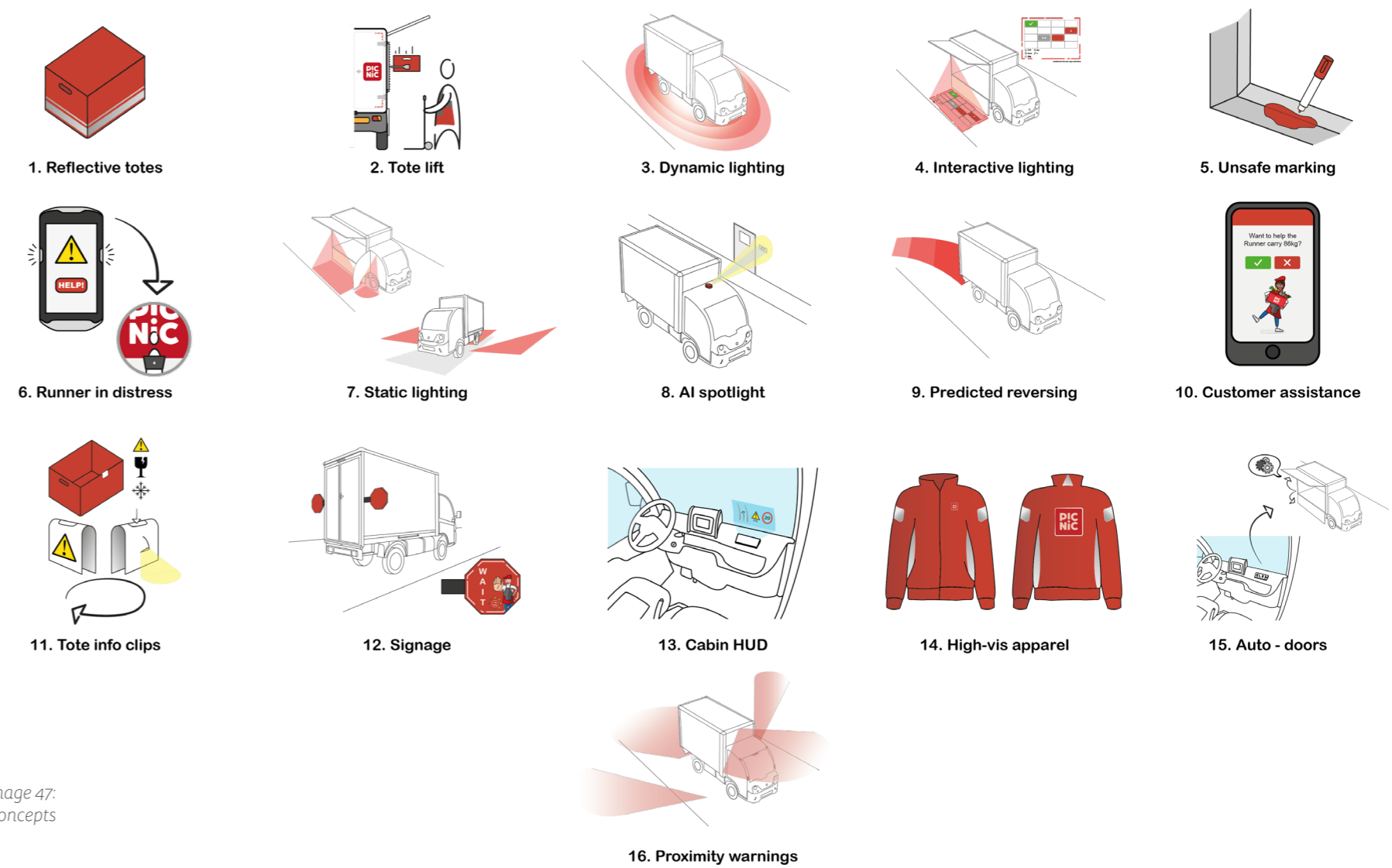
Image 47:
16 initial concepts

CONCEPT SELECTION

Once all of the 16 concepts had been evaluated and discussed, they were put into a Harris profile (Boeijen et al., 2017) and they were weighed on 3 main criteria with the use and impact on safety being considered on the side *[Image 48]*:

- Desirability   Does it solve the pain point?
- Feasibility   Does it fit my operational strengths?
- Viability   Does it allow for long term growth?

With a couple concepts already known as unsuitable, the profile confirmed the suspicions. The top concepts were: 7, 12, 13, 14 and 16. A few others also had decent resonance to the criteria and may be referred back to.

From this selection aspect from the highest ranking concepts were taken and either developed further or combined into two refined concepts, A & B.

Concept	Desirability	Feasibility	Viability	Total
1	-	O	++	+
2	+	-	--	-
3	O	O	-	-
4	++	-	+	+++
5	O	O	O	O
6	O	+	+	++
7	++	++	+	+++++
8	-	-	O	--
9	O	+	+	++
10	O	++	O	++
11	+	+	O	++
12	++	++	++	++++++
13	+	+	++	++++
14	++	+	++	+++++
15	O	+	+	++
16	+	+	++	++++

Range	--, -, O, +, ++

Image 48:
Concept selection
Harris profile

Runner making a
heavy delivery

REFINEMENT // CONCEPT A

The promising aspects from concepts 7, 12 & 14 were combined into concept A. These aspects are complementary towards each other. Concept A is a system of products that creates a noticeable boundary around the ePV for the Runner to safely gather their delivery without the public driving or cycling too close. It also will allow for the Runner to operate in dark times of the year as well as being seen by other road users. By utilising illumination this concept can communicate and warn road users of the Runners operation. This concept will function during two stages throughout the shift:

Parked
        Signage boundary from rear
        Projection of operation area
        Cabin egress illumination (when user is inside)
        Timer and sign to relax waiting driver when ePV is blocking road
        access

Slow manoeuvering, turning
        Blindspots are highlighted for cyclists and pedestrians

Runner usage / benefits:
        Runner is protected
        Runner is more visible to public - greater awareness
        Projection communicates area needed for operation
        Safe egress
        Cyclists are aware of blind spot placement in unusual vehicle
        turning circle
        Waiting driver knows how short a delivery can take

This concept requires little input from the Runner and thus has little impact on their delivery times.

Concept A presents many small products that make a larger impact as a system. This concept is really feasible and viable for Picnic. The visibility pain point is tackled clearly and is a desirable option to improve the safety of the Runner around the ePV. The result from this concept will be a physical prototype of a system, that will give Picnic a strong foundation to implement into the ePV2 and build upon as certain technologies improve. The main flaws in this product are the lack of interaction opportunities that can be tested.

Runners operate all year round, however, in winter they need to work when the sun is down making it hard for them to see and be seen as the current Runner winter jackets have no reflective or high-vis surfaces. This problem gets worse when they need to deliver on the roadside *[Image 49]*. Due to the nature of the ePV's cargo the Runner cannot gather the delivery items from the rears, meaning that (if parked on the road) they are operating when cars are passing by with minimal awareness they are there. In this project we found that the G4 has unusual and large blindspots, but the public don't know this and thus Runners need to take more care. *(Worlddata.info, 2020)*

Image 49: A dark roadside delivery

SLOW MANOEUVRE

Blindspots displayed during low speeds

Message / timer for waiting drivers

Warning sign for operation zoning

Illuminated operation area

Warning of egress via illumination

PARKED
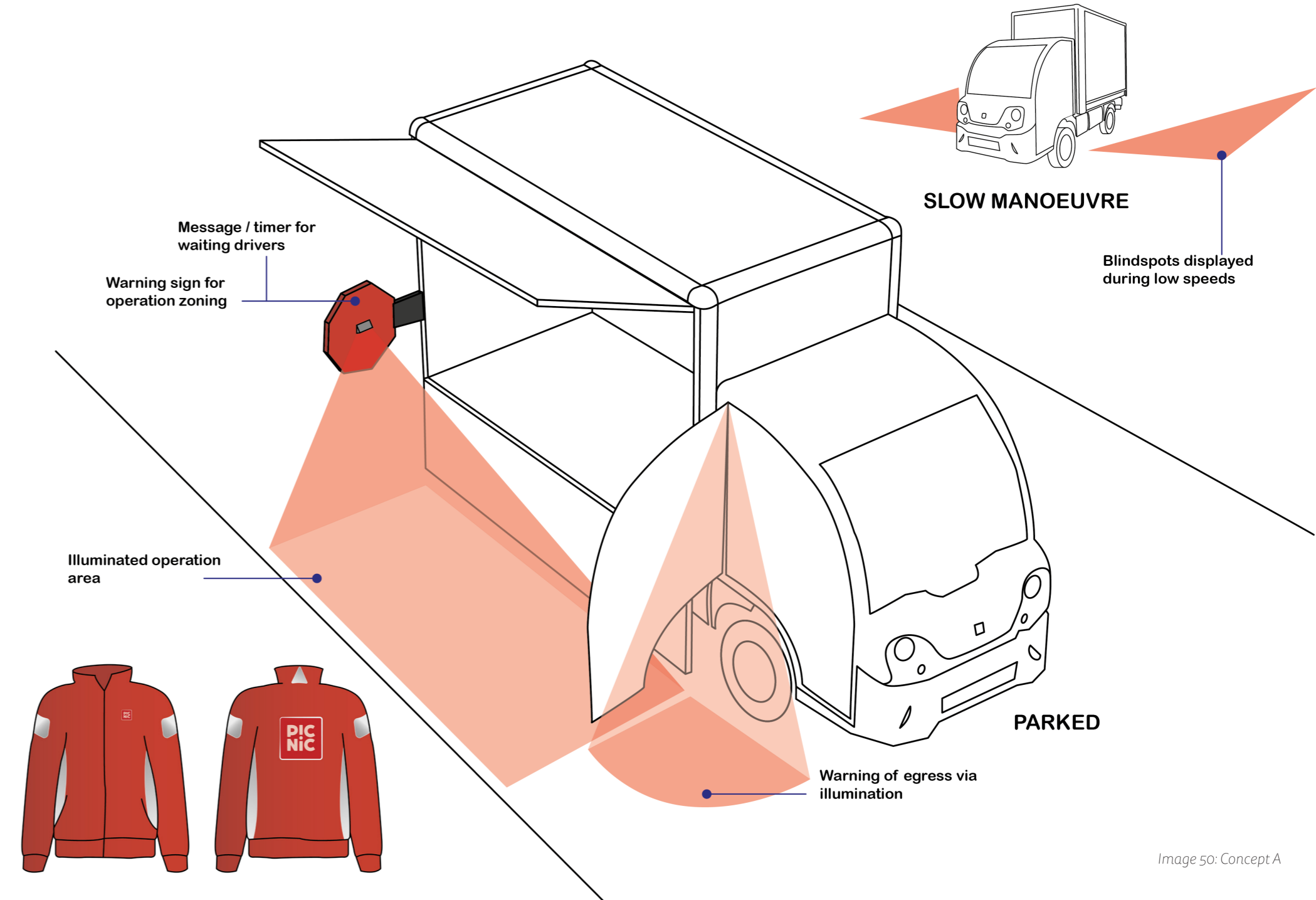
Image 50: Concept A

REFINEMENT // CONCEPT B

A full screen Heads Up Display (HUD) that displays relevant information to the Runner whilst out on delivery. The display will not be directly interactive but will respond to input from the Runner app. This concept is a combination of 8, 13 & 16 this concept is more focused around reducing distractions and improving awareness of danger and data.

Display:
> Locate delivery destination
> Speed limit
> Live feedback from driving coach
> Warning of surroundings and safe egress
> Delivery side indications
> Dangerous driving alert

Runner usage / benefits:
> Reduce driving distractions via HUD (less time of eyes off Road)
> Prevention of driving actions
> Obstacle proximity detection
> Safe roadside egress
> This concept does not protect the Runner, instead it gives them the knowledge and information to make safer decisions.

The aspects presented in concept B are appealing to both this project and to Picnic. This interface provided a blank canvas for future development of additional features to improve the Runner experience. The technology for this does exist but it is currently not available for commercial usage, especially for a full windscreen scale *[Image 51] ("Building a HUD", 2017)*. Prototyping this concept will likely end with an animated video of the concept functions, a low fidelity model of the working technology, and user tests done via discussion and wizard of Oz. Proof of safety will mainly have to be done via research on the impact of HUDs and danger indicators. Despite its desirability, this concept has flaws in business viability and prototyping feasibility.

From the observations (both regular and GoPro) it was noted that the Runner gets very distracted whilst driving due to the multiple touch points available in the cabin: scanner, Runner sheet, radio, personal phone, etc. By moving most of this data to a HUD will decrease the amount of time the Runner spends with their eyes off of the road *[Image 52]*. Additionally there were multiple complaints about the ability to locate delivery destinations, using a live map guidance via a HUD could increase the efficiency of delivery driving time.
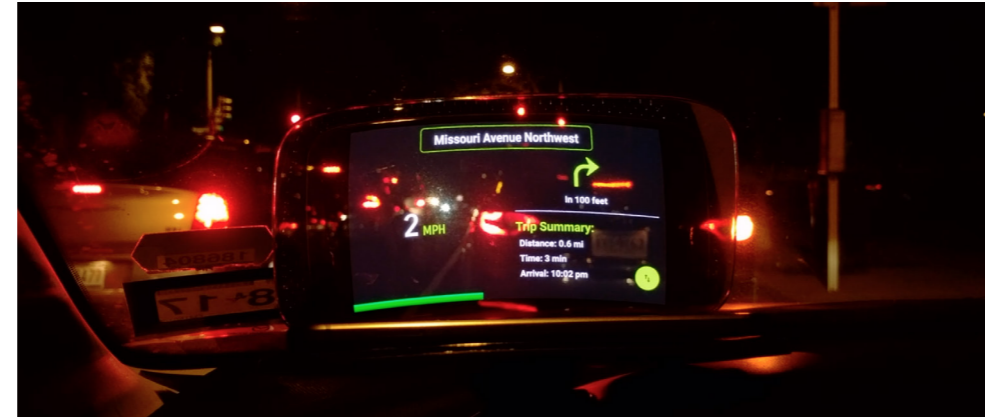
Image 51: Mapbox HUD ("Building a HUD", 2017)

Images 52: Runner being distracted, from GoPro observations

Balcony detected / rear obstical (reversing)

Destination

Careful exiting

SLOW DOWN

Delivery side

Speed limit
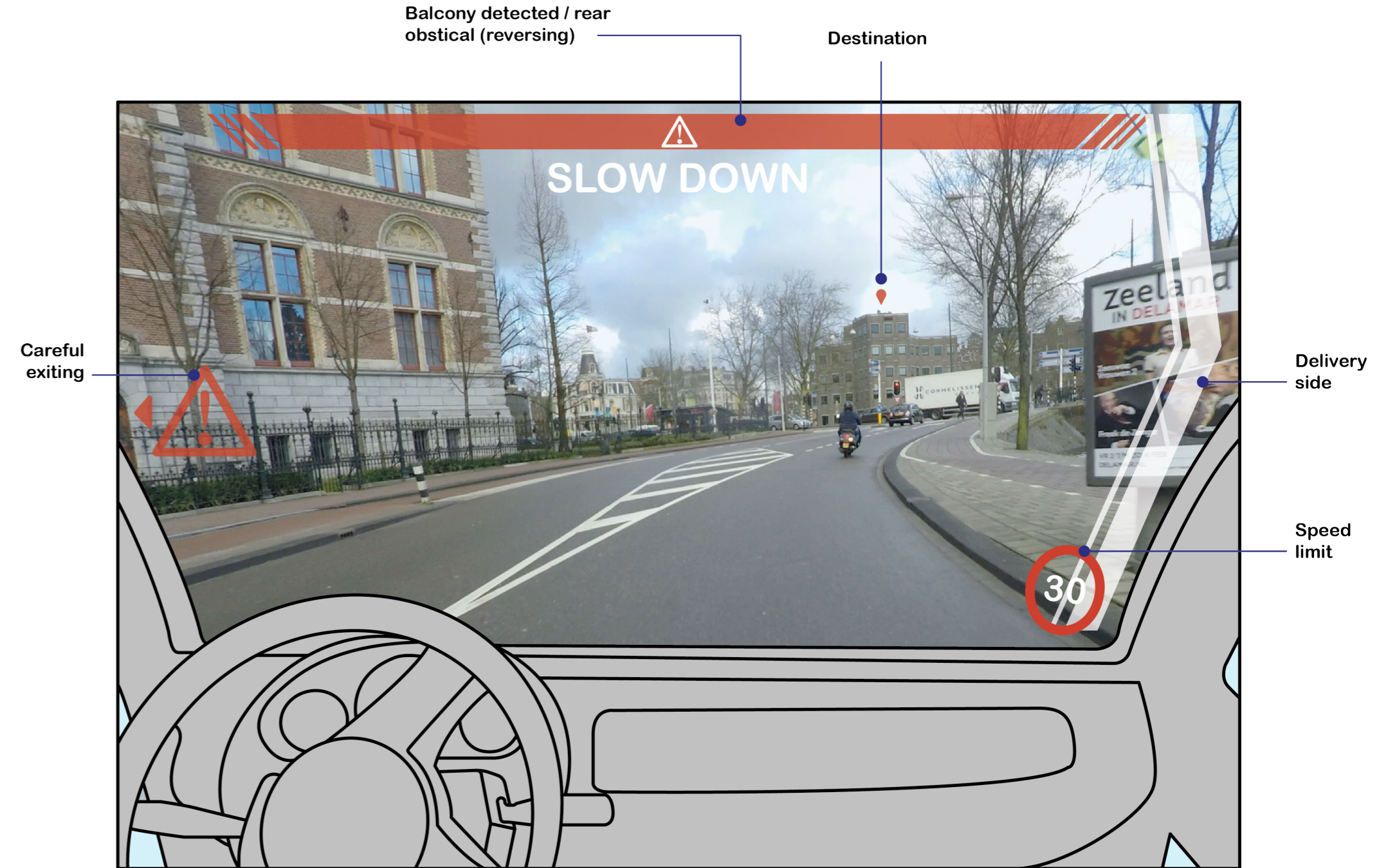
Image 53: Concept B

REFINEMENT

Analogies

Analogies were created to guide the prototyping progress. By giving the concepts characteristics it provides a direction to follow whilst making changes to the concept details through prototyping. *(Boeijen et al., 2017)*
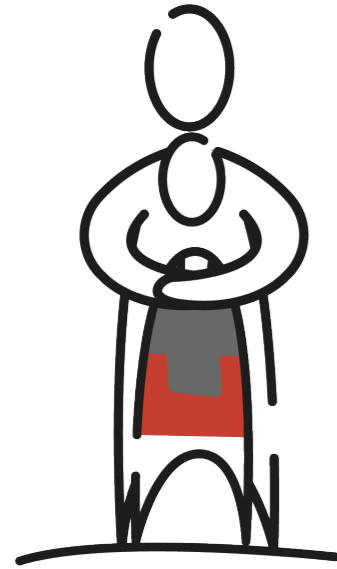
Image 54: A caring parent

Image 55: A guiding parent

Concept A: Caring parent
This concept protects and cares for the Runner by making sure they are safe and able to live without worry. This parent will prevent danger and put themselves before the Runner, whilst proudly showing them to the world.

Concept B: Guiding parent
This parent wants the Runner to do their best and be safe. They guide the Runner on their journey via a visual conversation. It will remind them of dangers and correct them when they make an error.

CHOSEN CONCEPT

Both second stage concepts were evaluated in further detail than the previous selection. All of the speculated concept aspects were laid out and compared, this included; the impact on safety, how the Runner would be affected and the concepts desirability, feasibility and desirability. The concepts were also presented to the project stakeholders; the distribution team and Runners.

Although the idea of concept B was appealing to the Runners, the lack of technology and feasibility for the short term made it less desirable for Picnic. Concept A, being more physical and less futuristic wasn't as appealing to the Runners as concept B was. Concept A was ultimately chosen as it was more feasible to prototype and will provide a viable foundation for Picnic to implement with, and has more of an imeditate, short term impact on the Runners' safety. Concept A showed more opportunity to do physical user tests within the project's completion.
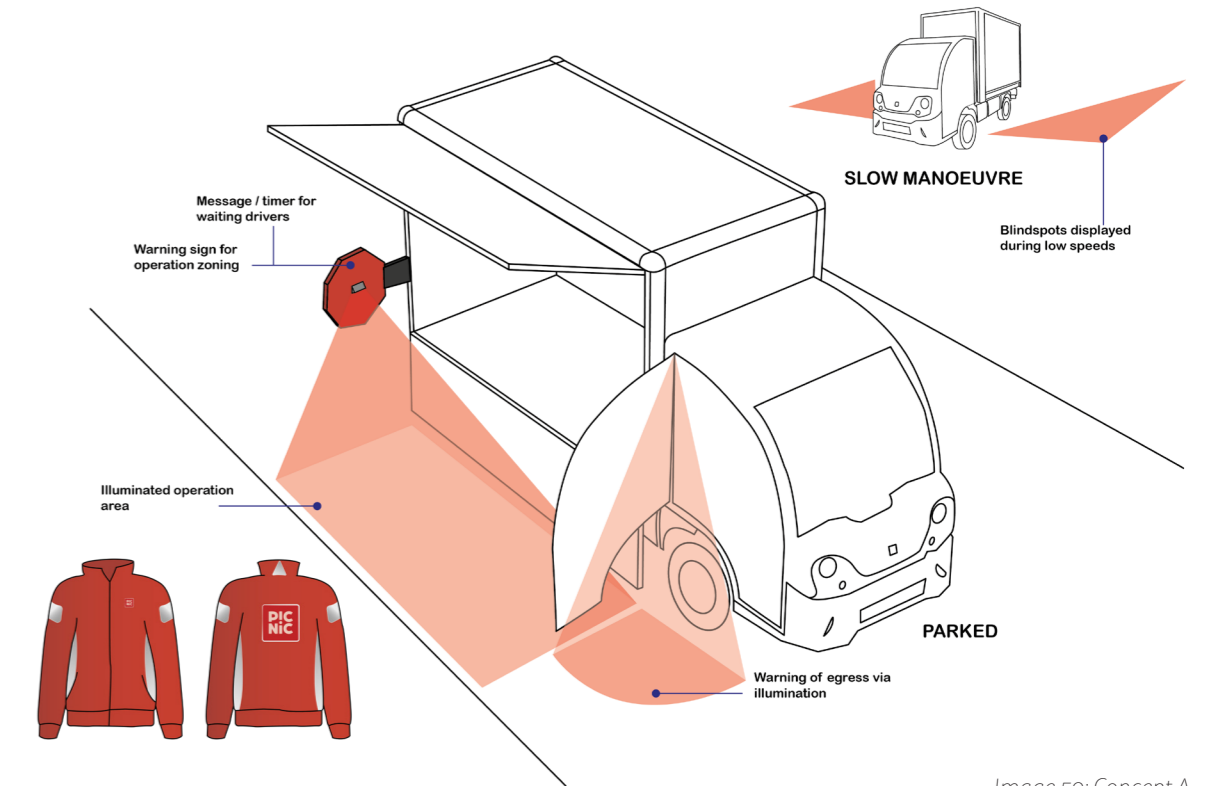
Image 50: Concept A

A Runner gathering a delivery

.4 CONCEPT REALISATION

CONCEPT VALIDATION

Approach revisited

Due to the time limitation in the project scope the first set of prototyping is substituted with validation via knowledge gained from literature and discussing the concept with experts. This was done to confirm the form and function of the various concept features. Validating a concept's details allows for a jump start into prototyping by reducing the amount of iterations and allowing user testing to begin with a higher fidelity prototype.

DESIGN THINKING
A FRAMEWORK FOR INNOVATION

EMPATHISE
Innovation should be user-centered

IDEATE
Innovation is born from a clash of ideas

CONTEXT   FORM

DEFINE
Innovation should solve a problem

TEST
Innovation should be refined

PROTOTYPE
Innovation should be brought to life

Image 8: Design thinking model
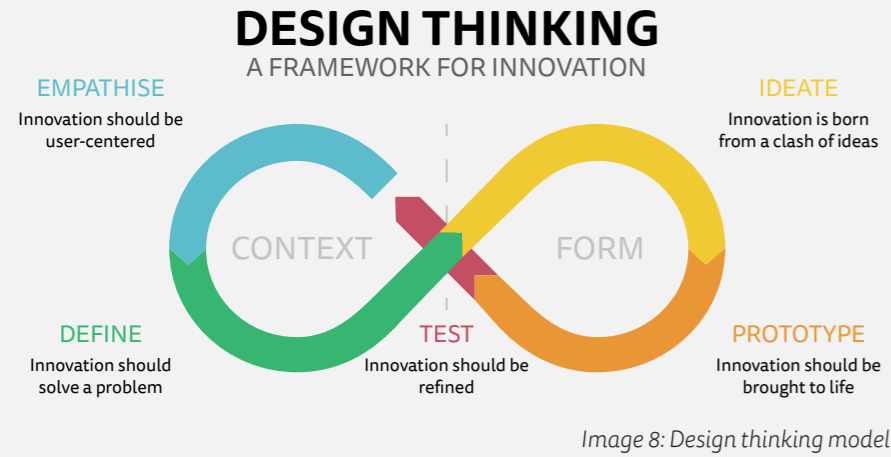
Picnic Branding

A meeting was had with one of Picnic's lead illustrators to discuss how to ensure that Picnic's friendly and playful brand is continued into this concept. The aim of this exercise is to ensure the brand remains consistent throughout the ePV2. The input from the brand identity will have a big effect on the appearance of this concept, especially in phraseing, colour and user perception.

The refined concept A was presented to him and explained what its does and where sticking to the brand is relevant and how the illustration would be used.

The main points that the design should follow:

Friendly -   No sharp corners or aggressive forms. Images should be playful to the eye.

Simplicity -   Picnic uses a large quantity of illustrations making so many is faster when there are less details.

Variation -   Keep the illustration interesting, with varying versions to keep it looking new each time with new details.

This brand knowledge will mainly be applied to the jacket and sign design, it will also affect the other areas of the concept. The brand influence provides an interesting opportunity to use a variation of playful designs. Picnic has 3 mascots; Peter, Paula and Pelle *[Image 57]*.

He summarized that when it comes to branding in the public the main factors that should be considered are brand, communication of imagery and how users will perceive it. These three factors influence each other and are used when creating the Picnic illustrations.

Communication

Brand   **Perception**

Image 56: Picnic branding factors
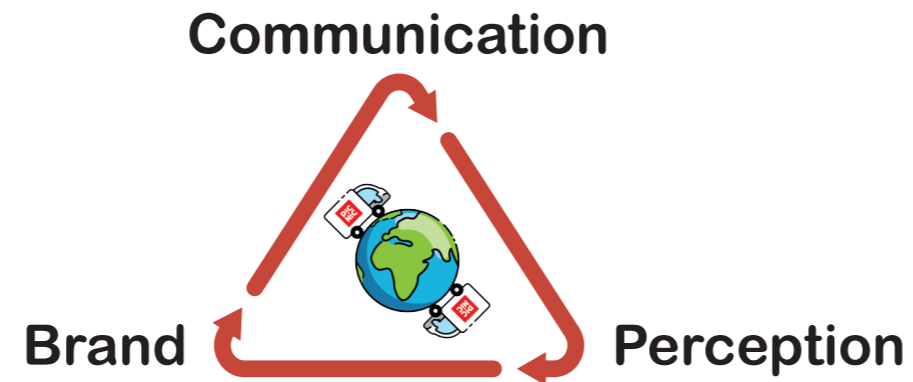
CONCEPT VALIDATION // JACKET

During the research phase many Runners mentioned that they often don't feel seen by other vehicles, this is most likely due to the fact that their uniform does not include any reflective or high visibility materials. High-vis should be added to their jackets that are most commonly used during winter where the dark nights are longer. As to not disrupt the brand with plain reflective patterning, an opportunity was seen to suggest a different way to look at designing the jackets. Many Runners will wear reflective gear if told to, but often don't find it appealing and would rather be unsafe than to wear default high-vis. Using the jacket as a brand conduit, it can be made into a playful aesthetic.

The Runner themselves are fun characters as presented by the cartoons on the App, ePV and advertisements, by using costume illustrations on the jackets can give the Runner additional personas that are appealing to wear and also fun for the children they deliver too. Reflective materials can be applied to fit an illustration, going beyond the normal builder trend. These jackets will display an image during the day and during the night certain areas will be reflective to reveal similar imagery, per example in *[Image 60]*.

Images 58-59 show examples of what these designs could look like during the day and night. The designs show personas, like the Picnic superhero or a backpack delivery. Others may include; ninja, spaceman, pirate, etc. But can also be used for subtle advertising.

Image 60: Exsisting product example

Image 58: Jacket designs in daytime

Image 59: Jacket designs reflective in nighttime

CONCEPT VALIDATION // SIGN

In the concept the sign was to function similarly to that of the STOP sign that activates when an American yellow school bus drops off children *[Image 61]*. The goal of the sign is to provide the Runner with a safe gathering space, whilst also notifying other road users of their presence.

Image 61: Yellow bus stop sign

Appearence
The sign is not merely just an advertisement but a safety suggestion to the public, this design will need to imbody the picnic playfulness whilst also being understood as a common road sign. Any written messages need to be friendly and not commanding, whilst being understandable from a distance with little text for communication. Since it is a form of road sign it should be made of reflective material.

Form
In order to find a suitable size for the face of the sign, the manufacturing rules of road signs were considered. A standard states that the faster the traffic is moving past the sign the larger it needs to be for the driver to read it before passing. When traffic is moving slower than 30kph (Traffic Signs Manual, 2018) the signs should be 600mm^2. However, this may be too large to implement within the cargo doors. Cars that pass by a parked

Triangle - warn
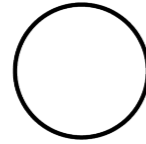
Circle - give orders
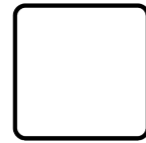
Square / rectangle - inform

Red - warning limitation

Blue - mandatory instruction / info
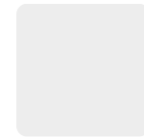
Yellow / white- temporary signs / info

Exception - priority rules

Image 62:
Sign form language
in Netherlands

ePV are more likely to be traveling slower than 30kpm due narrower access, thus allowing for a smaller sign size as long as it is still legible and can be understood from a distance. Due to the nature of the delivery environments passing vehicles will be going slow enough to allow for a sign size of 500mm^2.

The sign will extend out from the ePV to zone out close passing vehicles, from observations, the Runner will need a maximum distance of 900mm from the ePV to operate as they need to pull out the totes completely. This measurement also considers the step back distance from the ePV2 steps. The sign arm will end up being around 800mm long, as to not over compensate for the space usage.

The shape of the sign is influenced by the common knowledge of road sign language that is currently used in the Netherlands *(Anwb.nl, 2020)*.   The
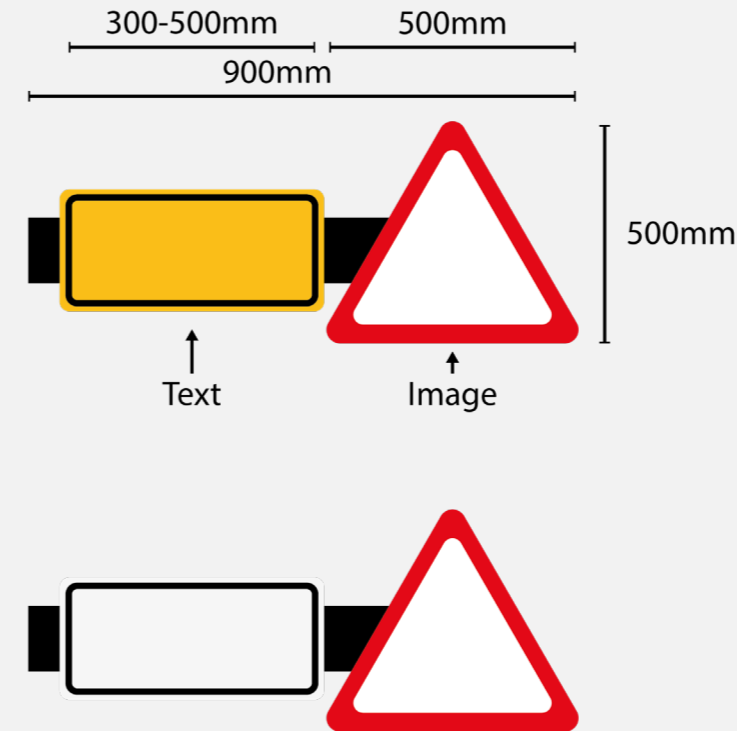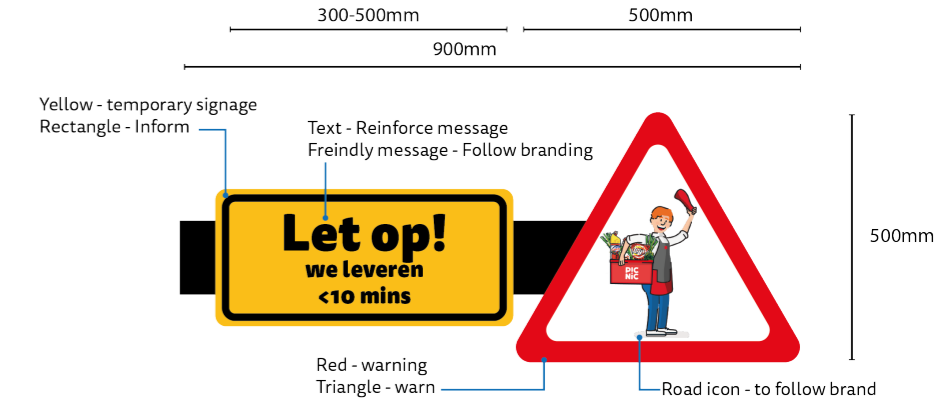

Image 63:
2nd itteration of sign
designs
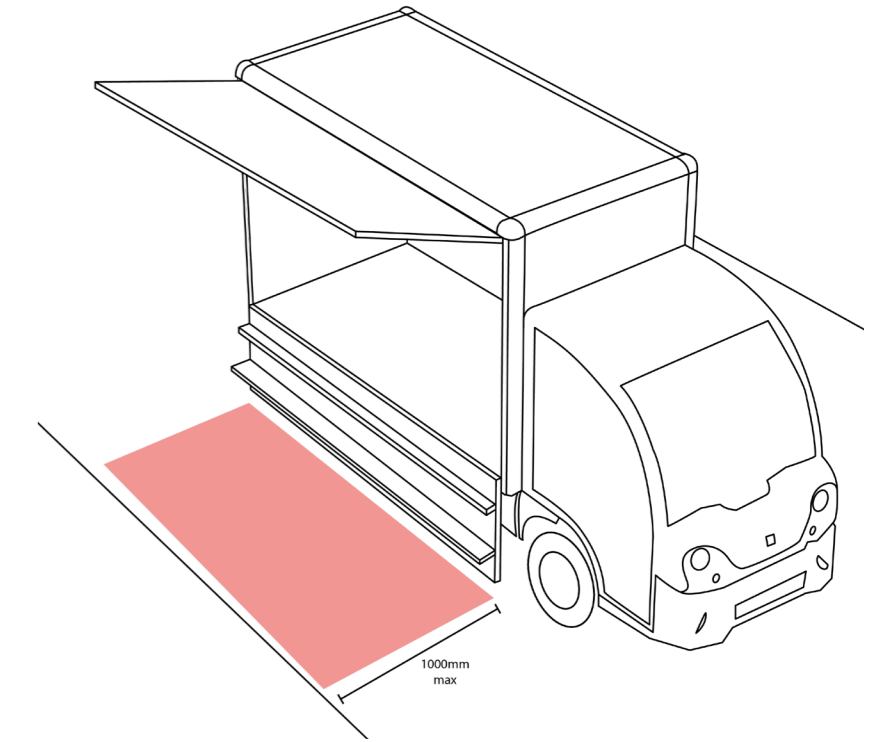

Image 64:
3rd itteration of sign design

Image 65:
Area of operation the Runner uses

language portrayed in road signs is communicated via colour and form *[Image 62]*, with the icon or text specifying details. In order to implement this form language the wanted sign message needed to be clarified. This sign is for maintaining an area that the Runner can operate in safely, whilst also communicating to other road users what is happening. Thus the sign needs to warn road users of the Runners presence (for the Runners' safety) with a temporary message. A red triangle and yellow rectangle message fit the context needs of warning with temporary information. Just having an image will not be enough to be instantly recognisable as many external users may not know of the unusual delivery task. Text will help to reinforce the feedforward *(Bowie, 2009).*

Wait message
Often when a Runner is unable to find parking spaces, they may need to block the road inorder to deliver. This can cause other road users who are waiting to become agitated and sometimes aggressive. A delivery rarely takes longer than 10mins, this timer will countdown to when the specific delivery will end to reduce the blocked drivers uncertainty of waiting. It has been proven, from countdown traffic lights, that providing a waiting driver with more information reduces their restlessness and gives them a greater sense of traffic efficiency. Overall the waiting driver's psychology is better with a timer *(Pan et al., 2017).*

Interaction
If a timer was to be used, how would it be activated and what would it look like? To follow the brand it needs to be friendly and understandable, hence why a basic digital timer might seem too aggressive. There needs to be a message alongside the timer to give the countdown context. A playful version of the timer could be an egg timer that shows the count down with movement.

Ideally the timer would automatically set by the Runner app (that will be incorporated into the ePV2 dashboard). A manually set timer will have too much impact on the Runner's droptime per delivery. Another alternative is to use the average delivery time and have it reset each time the cargo doors are opened. It is key to note this timer should only be active when the ePV is blocking access.
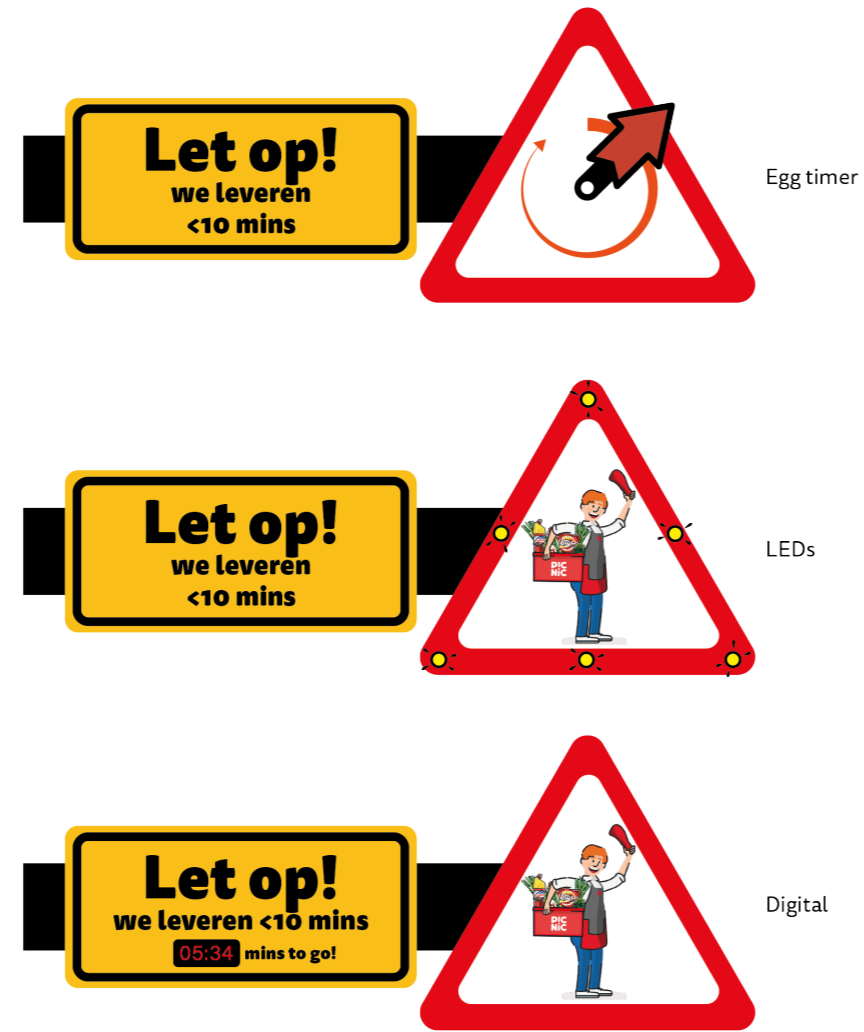
Egg timer

LEDs

Digital

Image 66: Timer type concepts

Development
The sign design evolved as the design was constantly discussed with the stakeholders and illustration experts. The design went through many iterations and ended up becoming two separate features *[image 67]*. Initially the design was a combination of two signs, one for warning and the other for information, this was then added to an arm extension to increase the safe zone for gathering deliveries. The information sign's colour was altered to white, since it was noted by the stakeholders that yellow is more commonly understood as diversion information. This orientation was carried forward and the message and imagery was added.

It was at this stage that the use of a timer in the sign was discontinued as when discussed with Runners, they mentioned it would never be used. As found in the research Runners will put efficiency before safety, thus having them input a set time into a timer wouldn't be appealing to them. Additionally having a countdown timer by itself might not fully convey the desired message and as mentioned by *(Pan et al., 2017)* traffic light timers can cause drivers to preempt the ending of a timer. This could lead to distrust in the brand and additional pressure on the Runner if they are not back before the countdown ends. In order to carry forward this concept of communication, a message to notify waiting drivers will be used instead.

After the fourth design iteration it was realised that the signs needed to be split up as together they produce a double message. Additionally in most scenarios when one of these signs will be needed the other won't be. Blocking road access will need the information sign and gathering near traffic will require the warning sign. After the split in design the two signs were designed further, to match the main factors; user perception, communication and branding. These two signs are referred to as the warning sign and the wait sign.
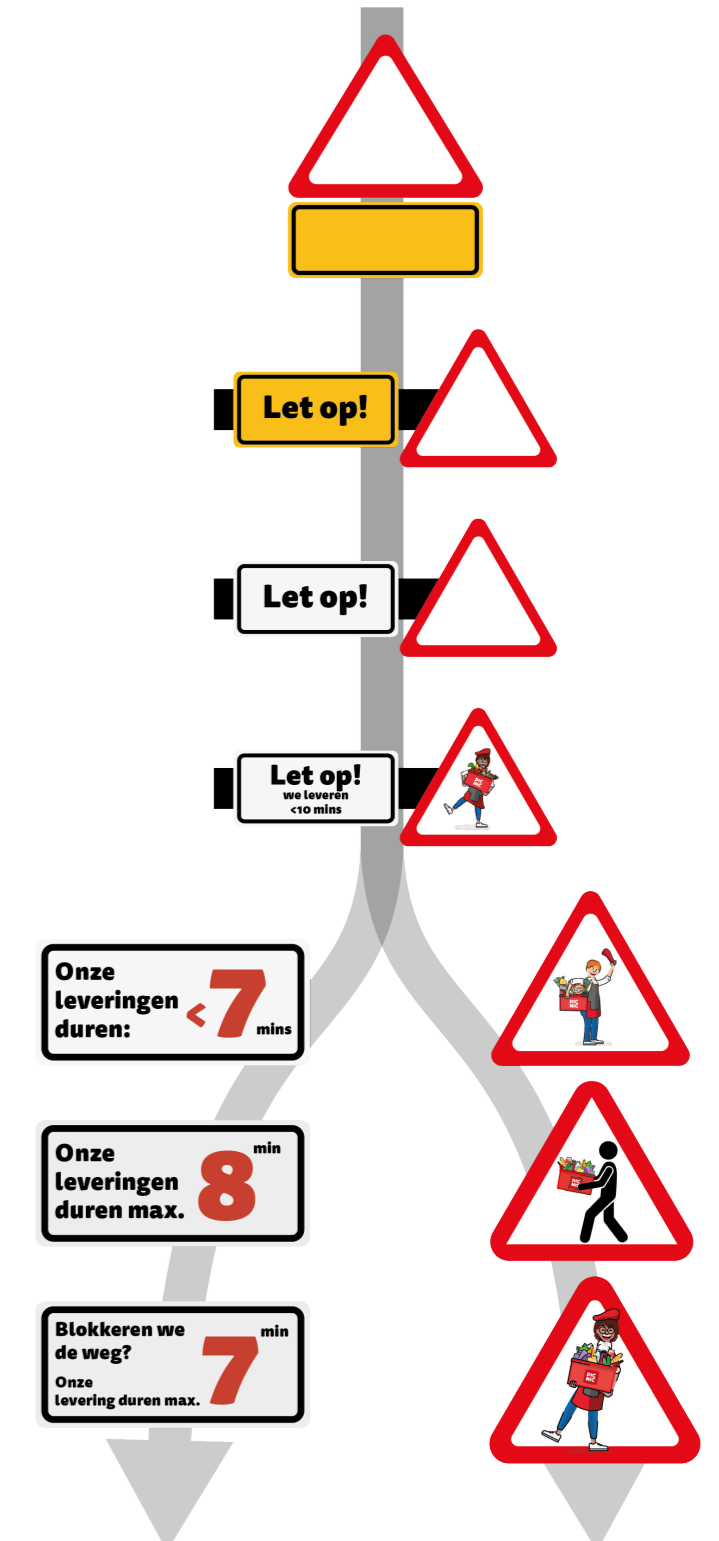
*Image 67:
Itterations of sign
designs*

Imagery

The aim of the warning sign design is to warn other road users of the Runner's presence when they are gathering deliveries. The image use should be easily understood and still be a fluid extension of the brand. From talking to the Picnic brand expert, it is known that the sign should be friendly and contain variation. The images used were initially based on the Picnic mascots as a representation of the Runners. Standard road signs often use figures similar to stick men as they are simple and universally understood, this style of character was tried in the sign design with a Picnic tote. *Image 68* shows the range of characters that were used in initial warning sign design, some were rejected as they failed to suit the brand.

The triangular exterior was also played with to see if it could be altered to be more friendly with curved corners and thicker red borders *[Image 67]*. The broken outlines that Picnic tend to use in their illustrations was also tried. From these options a range of designs were made with each column and row representing different aspects.

Message

To fit the brand the message cannot be commanding and should be more suggestive. As the message evolved the wording changed. Earlier messages said "look out!" instead of "stay clear!". After the timer was no longer going to be used and the signs split up, a time suggestion was added to the message and the "look out" message removed. With the signs now split the wait message will only be used when the ePV is blocking road access, for this the message was adapted to no longer warn the driver of the Runner, but to instead let them know that the Runner will not be long. The stakeholders questioned the fourth iteration as it felt too much like an advert, the language was given a playful question followed by a solution; "Are we blocking the road? This delivery will take max 7 mins". The final message will be used when the blocked access situation occurs, otherwise it will remain hidden. If the message can be outside of the situation it can easily be interpreted as an advert.

Seven minutes was chosen as a short but understandable amount of time to wait. The average drop time for a delivery is 4.3 minutes, seven gives the tolerance in case the Runner cannot do it so quickly. This overshoot of timing follows the rule of early gratification, where if a car is blocked and waiting, they will be happy to see the Runner return soon then the mentioned time on the sign. If the Runner takes longer than a stated time, it could irritate the waiting driver further, causing distrust in the Picnic brand.

Image 68: Characters used in warning sign iterations

Image 69: Wait sign iterations

Expert review

The development of the signs and the range of final variations were presented to the Picnic brand and illustration expert for feedback and validation. Overall he was grateful that the brand was being taken into consideration with safety features for the ePV as this is often overlooked and when done poorly can interrupt the Picnic image of the ePV.

For the warning sign, the stickman-esque design was too bold and disembodied from the branding for him, additionally it gave less chance for design variation. As mentioned previously the design in the sign isn't required to be instantly recognisable as vehicles will not be passing by faster than 25kpm. In a paper about sign recognition it mentions "road users are heterogeneous in their perception and processing of information" *(Bortei-Doku, Kaplan, Prato & Nielsen, 2017)*, they are also a very wide user audience thus testing the user perception of the sign imagery is difficult. By using the Picnic trio as models for the warning, it not only fits the brand but it allows the illustration team to continuously create new variations, such that each vehicle can have its own unique warning sign.

As for the layout he preferred the design that had the characters overlapping the red border as it added a playful feel and made the warning feel less threatening and more cautionary. However, he was not a fan of the use of the outlines in the triangle, noting that it distracts too much from the idea that it is a warning. The outlined design in *[Image 70]* were his chosen designs to use. For the wait sign he agreed with the message and how the font sizes direct your attention to the correct information. The chosen designs were sent to a sign manufacturer for printing for the prototype *[Image 71]*.

Image 70: Range of warning sign designs and characters, with selected favorites from expert

Image 71: Chosen two final designs for the warning and wait signs

Location

As previously mentioned the initial sign concept was to follow the similar operation of the yellow american school buses, by folding out of the side. From further investigation it was found that side folding is not ideal as it would block many of the totes upon opening the cargo for delivery *[image 72]*. The slide fold will also require the Runner to fold it out every time, even when the situation does not call for it, this will greatly impact the Runner drop time if put into effect. With the ePV2 the cargo will have split doors, this provides another opportunity to attach the sign to the door, thus when it is open the sign can drop down without obstructing tote access. It is key to mention that the sign is not required to be used at every delivery and only when the Runner feels threatened by passing traffic, this in turn will have added little to the average drop time as it will only be used for a select few drops. After constant usage the Runner may become more comfortable with the dangerous situation and forgo its usage. It is speculated that new Runners will obtain the most value from this feature.

*Image 72:
Example of use of
side fold*

Ideal operation

When Runner's find themselves in either of the following two scenarios they can use the relevant sign to either feel safer or to help communicate a message to those around them:

scenario 1: They have parked blocking road access during a delivery, and vehicles show up and wait

scenario 2: The Runner has to deliver from the cargo on the roadside with moving traffic

For the wait sign this will be attached to the rear of the ePV, hidden, and it will be revealed by the Runner prior to scenario 1. The warning sign will be activated via a pull string that brings it down. The sign will not freefall, it should be on a sprung hinge that snaps into place in two orientations of 90°. During scenario 2 the sign will give them more space to gather the delivery. If the sign was to be hit by traffic or other, the hinge will spring back to its folded position. Both signs are not required to be used at all times and provided to improve situations that have been commonly mentioned by Runners.
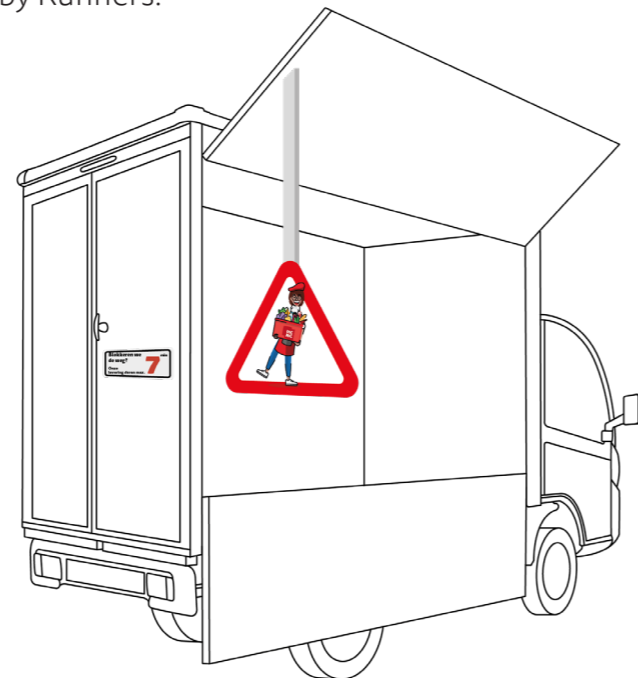
*Image 73: Drop down
sign deployment*

CONCEPT VALIDATION // ILLUMINATION

Cargo

In the concept the illumination of the cargo and working area is shown to be a projection.
Beyond a concept it was realised through further research that a projection might not be a realistic option. A sharp illuminated area can indeed be produced by a projector, however, projectors are often bulky and require a fair amount of energy to operate. These features make this method of illumination an undesirable addition to the ePV2. Therefore, direct or ambient lighting will be looked at instead. The location of the light source and its colour will be explored and validated.

The lighting environment will affect the way the product (vehicle) is perceived by the public, whilst it can also influence a user's ability to efficiently operate in. The optimal light source location can be found from testing on the product. A top down illumination may cast too many shadows and a side projection might cause brightness blindspots from the bulb itself. As for colour it may be assumed that red lighting would be useful for the brand and to give a sense of warning for on-lookers, but red lighting can be hard to perform tasks under due to the eyes limited recognition of red light wavelengths. White light, although deemed the best, has a tendency to reveal a product's flaws and dirt, which may not be ideal for Picnic's image.

Door

The door lighting is a similar situation to the cargos, the area does not have the capacity for a projector, thus an alternate solution is needed. The goal of the door lighting is to warn passing cars that the door is opening and not for operation visibility. The warning lights should only be active when out on delivery, as the doors are often left open in and around the Hubs.
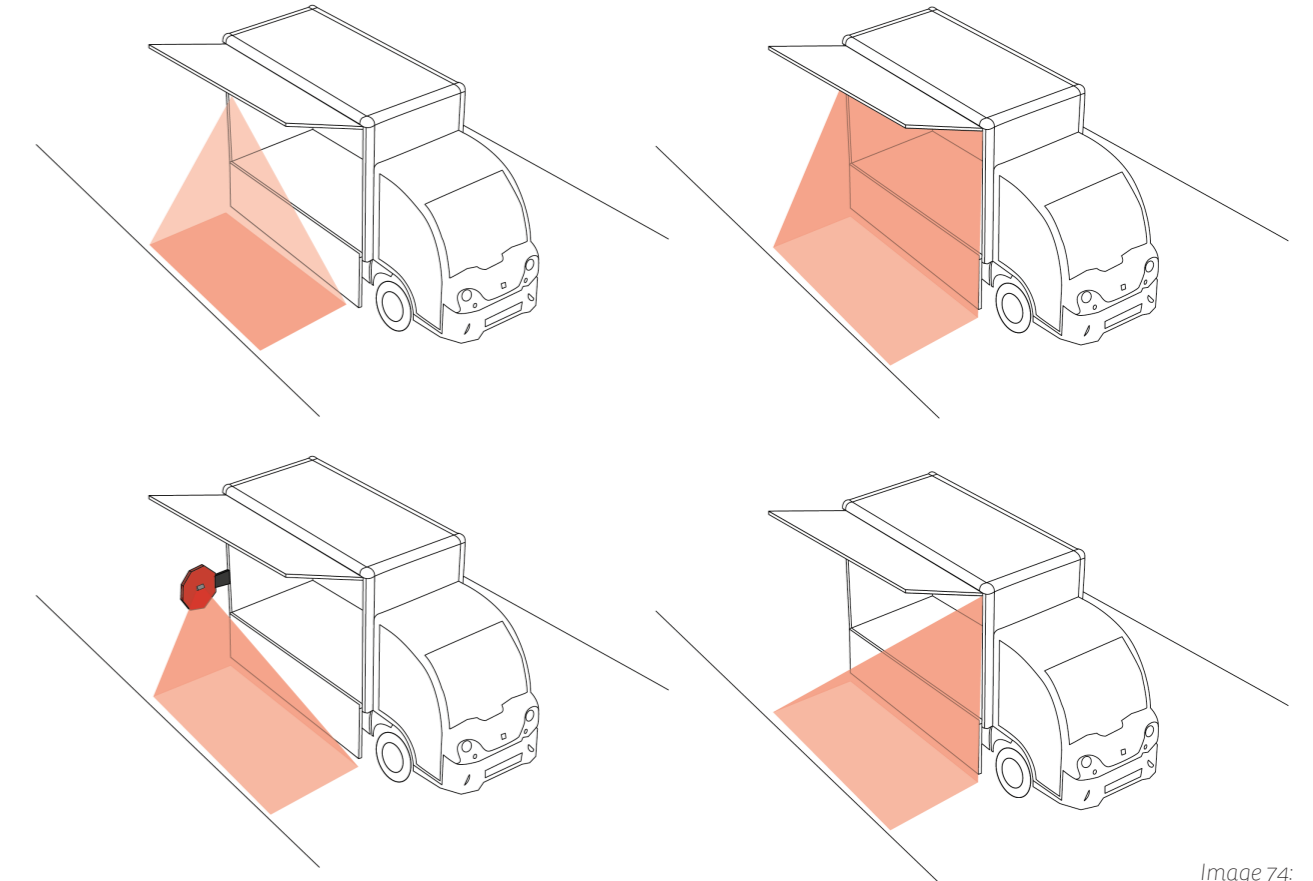
*Image 74:
Light source location
examples*

Lighting in context

A short research study was conducted into the light levels that the Runner may operate under whilst out for deliveries. It is key to mention that the current ePV does not have any lighting features on the sides of the vehicle. The only exterior lights being the front headlights and the rear lights. During the evenings in Netherlands is can get as dark as 0.0011 lux*. According to the OSA *(optical society of america)* the minimum street lighting in suburban areas is as low as 3 lux *(Recommended light levels, 2011)*. This is mostly for pathways within housing areas. CIBSE suggests that for distribution the movement of heavy goods should be conducted in 100-150 lux *(CIBSE, 2018)*. Throughout the year majority of the Runner's shifts lie within nonoptimal lux levels, twilight or later. This indicates that there is a clear need for the cargo lighting from a safety perspective *[image 75]*.

1 lux = 1 lumen per m2. For comparison: Daylight: 10,752 lux, Twilight: 10.8 lux, Clear night: 0.0011 lux

Daylight during the Runner's shifts
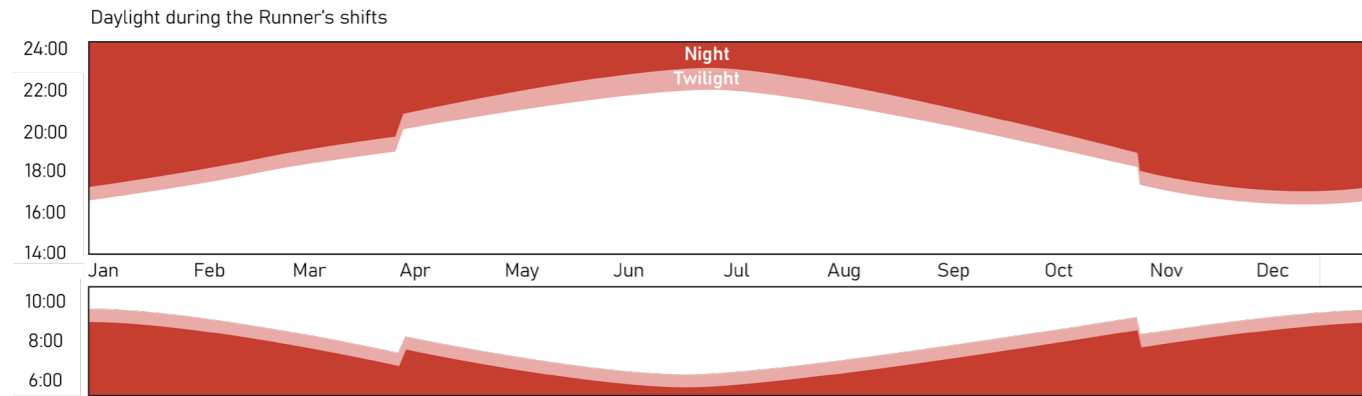
Image 75: Hours a Runner works without daylight (red) over a year

Testing

Using a RGB lamp and a LED natural light bar (4000k natural white light) the location and colour of the illumination was tested on an ePV in an unlit area at night. The aim of this test was to have images that can be discussed with the stakeholders and Runners regarding the preferred lighting setup.

The LED bar was attached to the ePV at various locations to see how the direction of lighting illuminates the interior and exterior of the cargo. For the interior it should cast minimal shadows and allow for the Runner to see clearly into the totes. The exterior workspace needs to be lit but the light source shouldn't be too obnoxious or distracting for other road users.

Because the test was conducted at a Picnic Hub passing Runners were asked about their opinion on the different options. Majority of the Runners instantly understood the aim of the lighting and were glad to see that this feature was being worked on as they find gathering at night highly frustrating. They were not so keen on the colour variations but liked the idea of a disco mode for fun. As for the natural lighting Runners prefered the yellow natural light over the blue natural light, an opinion that was also shared by the stakeholders. The reasoning for this is that the yellow light gives the ePV a calm and warm appearance, whilst the blue light gives a clinical appearance that doesn't match the red company branding. Between the Runner's and stakeholder's input it was decided to use natural yellow colouring that is attached on the top door and directed downwards towards the cargo.

Ideal operation

The end vision for the illumination feature is to have the lights integrated into the top doors on both sides of the ePV and have them directly wired to the ePV power supply. The lights should be activated via a pull cord switch, that the Runner can operate when needed. Using a sensor to turn the light on will be too complex, a light sensor can be affected by street lamps above and a time based sensor will need to be calibrated to the daylight cycle. A simple pull cord will suffice as the string can be reached by the shorter users and activated quickly when needed. *Addtional lighting test photos in Appx 16.*

Image 76: Light testing images

CONCEPT VALIDATION // BLINDSPOTS

Similar to the illumination, it was realised that a projector is not suitable for this situation due to its size and lethargic operation. Solutions to substitute the projector were looked into, this included patents, existing products and other means to display from the ePV. Patents and existing products proved to show nothing similar to what is wanted in the concept. Majority are cameras, screens and alerts that tell the driver if the blindspots are occupied. Although it may be useful for the Runners to be more aware, from research it was evident that the Runners already have too many distractions in the cabin, adding another isn't desirable.

For this concept the goal is to allow those around the ePV to understand that they are in the unusual blindspots. The speculated blindspots themselves are effectively a cone that has an indefinite distance to its end. Lasers are sometimes used as an add-on solution to display behind vehicles during fog. These laser lines could be repurposed to outline the blindspots. Compared to a projector, lasers are compact and have a low power usage with high visibility in the dark. By mounting these to the undercarriage, it can provide an obvious indication to the other road users.

Ideal operation
The lasers should be activated from the cabin dashboard, with them turning on when the ePV speed is between a certain threshold. This threshold will match the speeds that are needed to perform slow manoeuvres, such as crossing cycle paths, parking and driving around residential areas.
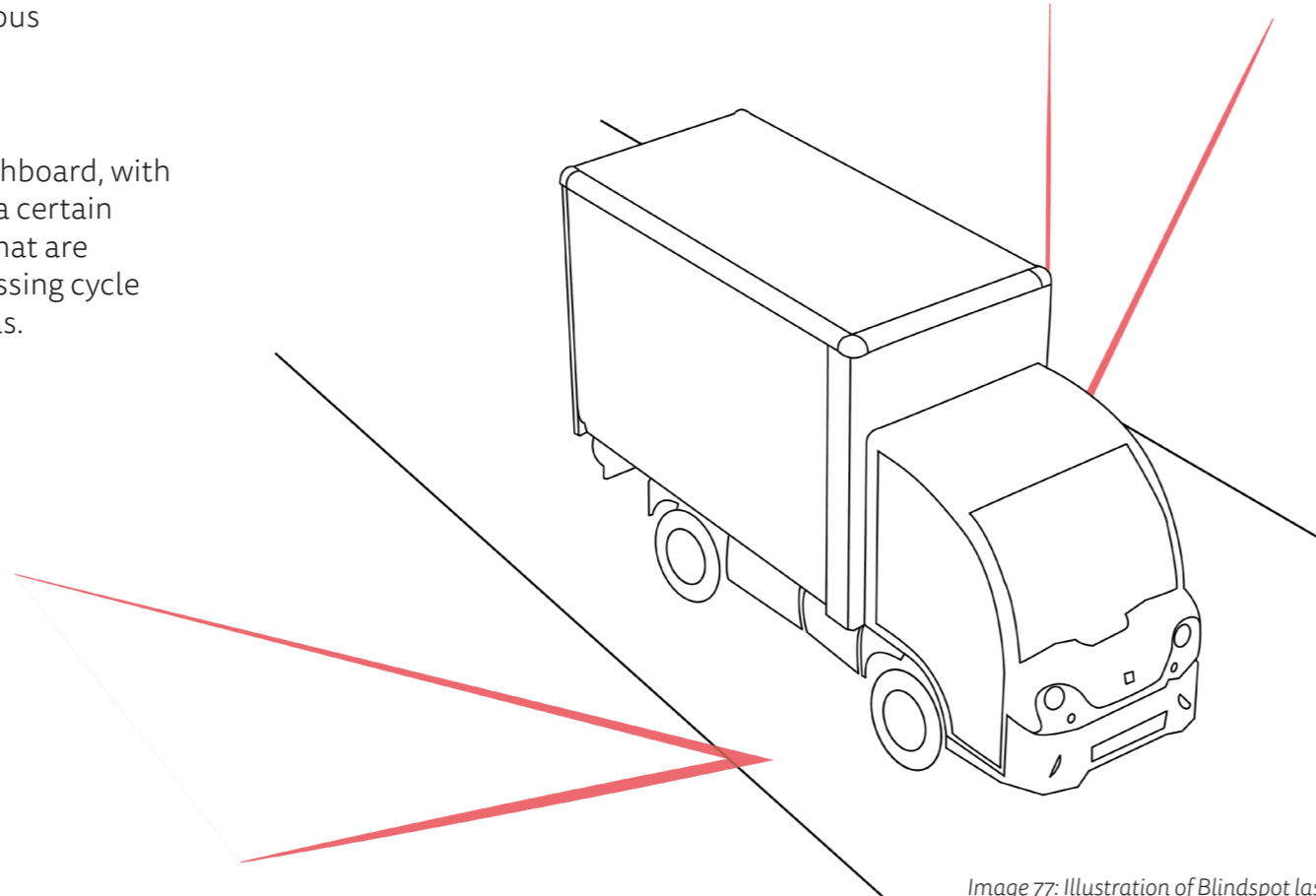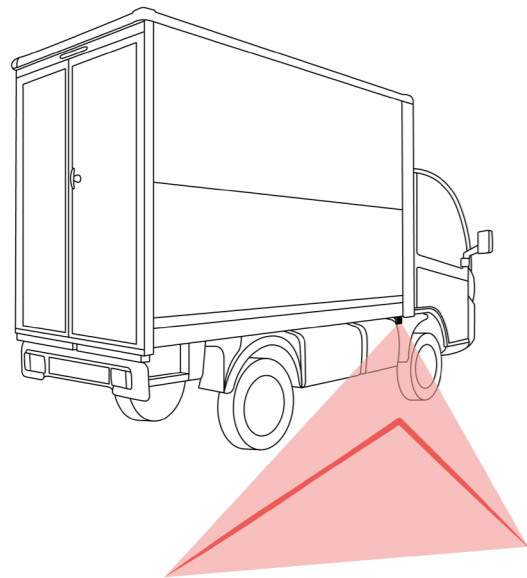
Image 77: Illustration of Blindspot lasers

SLOW MANOEUVRE

Blindspots outlines displayed during low speed manoeuvres

Warning sign of Runners at work

Message for waiting drivers

Warning of egress and open door via flashing light

Illuminated operation area

PARKED
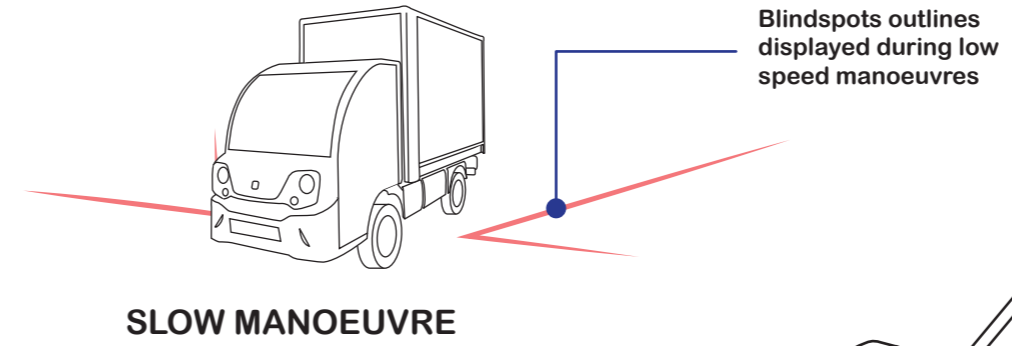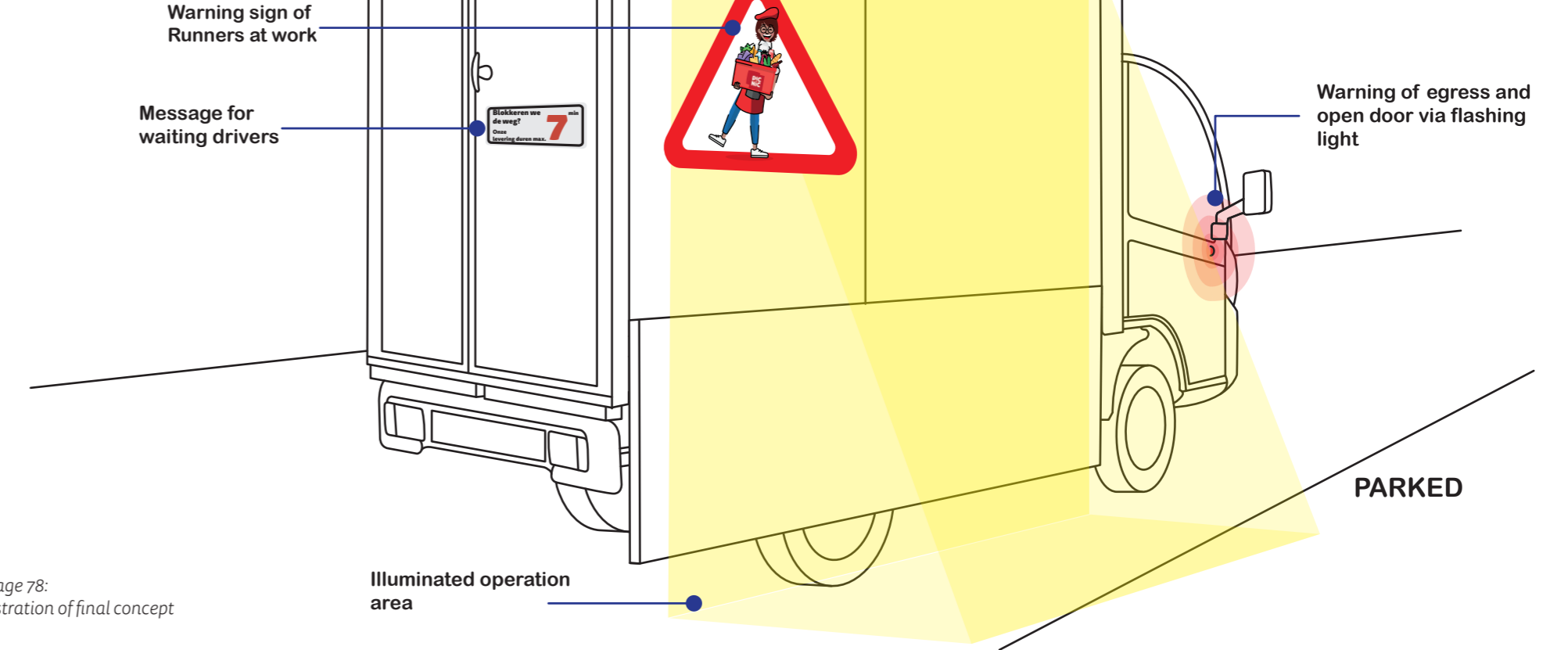
Image 78:
Ilustration of final concept

Inside a Picnic Hub

PROTOTYPING

5.1 Prototype // Build

PROTOTYPE // BUILD

Foundation

The aim of the prototype was to have a low fidelity representation of the concept features so that it can be user tested with. The user tests should return data on the users desirability of the concept. Fortunately Picnic supplied this project with an ePV that was used in previous ePV2 cargo logistic testing. This ePV2 cargo prototype was built upon a G4 model, it uses an early version of the split door design, however, it provides enough of a foundation to build from. The prototype will be built for this foundation, most measurements and sizing will not be relevant for the ePV2. Some features implemented on the cabin or undercarriage of the G4 prototype are simple enough to be incorporated into the ePV2.

Jacket

This part of the concept was not going to be prototyped and remain as an illustration, however, it will be beneficial to have a physical example of the addition of reflective material. For this, reflective tape was put onto a standard Picnic jacket. The applied pattern was basic and followed the arms and back, with no sharp corners and not matched to any of the illustrations. *Image 80* show the impact in visibility that adding high-vis can make.

Image 79: Foundation prototype ePV

Image 80: The impact of a reflective jacket

Image 81: Blindspot device attached to ePV

Blindspots

Due to the project scope limitations the lasers were prototyped without the activation speed threshold incorporated, instead they were activated by a simple switch. From the blindspot research conducted in the ideation phase the knowledge of the distance and angels of the blindspots were found. This was translated to the prototype for the passenger side. The beams would emit from the bottom front end of the cargo box *[image 84]*. The device itself was constructed of two line lasers and a battery box in a 3D printed harness. At a height of 730mm off the ground the lasers are mounted to the G4
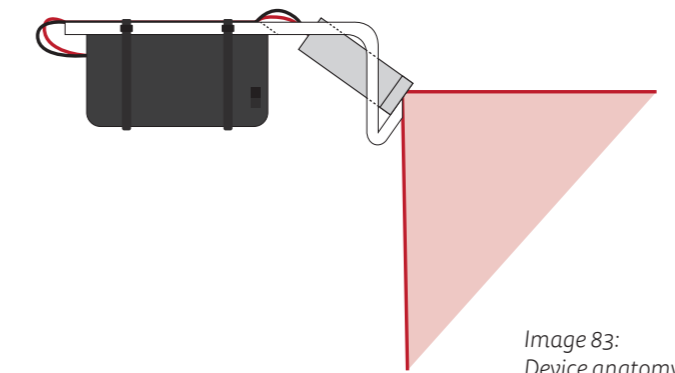
Image 83: Device anatomy
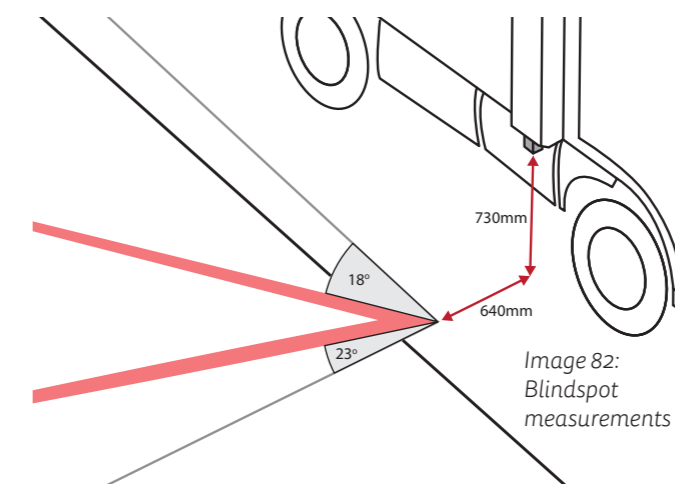
Image 82: Blindspot measurements

730mm

640mm

18°

23°

Image 84: Activated blindspots

Warning sign

The reflective sticker was mounted onto an aluminium backplate with a size of 500mm2. The arm is hinged at the rear of the top door flap. Due to the prototype foundation the door flap does not open fully, angling the sign slightly. On the rear of the sign, reflective tape was added to give a red triangle, mirroring the front side *[image 86]*. The sign folds upwards to the door and is fastened via a latch. The top door flap can close with ease and plenty of space for the folded sign inside.

Wait sign

Similar to the warning sign, the wait sign is also a reflective sticker on a aluminium backplate measuring 250x500mm. On the rear of the plate a elastic rope was added for hanging purposes. This allows it to be hung on both the warning sign and on the rear of the vehicle *[image 85]*.

Door lights

The door lights were small magnet activated lights that would cycle through a series of flashing modes. These were attached on both cabin doors just below the door handle on the inside. The magnet being attached to the interior, when the door is fully closed the lights would turn off.

Image 85:
Warning and wait sign combo

Image 86:
Backside of warning sign

Image 87:
Wait sign deloyed at rear

Image 88:
Warning sign fastened

Image 89: Door lighting

Image 90:
Visibility into totes with cargo lighting

Cargo lighting

Two LED bars were attached to the inner end of the top door flap and powered from the cabin's cigarette lighter. The bars produced 4000k natural white light at 600 lumen. They were located to give optimal coverage over the interior and to light up any totes pulled out below [image 91]. The coverage of the light extended a bit too far from the vehicle and might require a barndoor-esque casign to block the light from splitting away from the dedicated area.

Image 91: Cargo illumination in action

A solar ePV

.6

USER TESTING

EXPERT VALIDATION // SAFETY

Dr. F.W. Guldenmund

specialises in Occupational and Psychological safety at TU Delft, Guldenmund was surprised by the research findings and fascinated in the concept. He mentioned that a big factor of the safety for the Runners is in their attitude. Talking from personal experience and from a professional point of view, he mentioned how driving with respect to others can in itself improve how other drivers treat Picnic Runners in general. If the brand is fun and friendly then the Runners should be an extension of this both personal and when driving.

There was little he could find wrong with the concept, he noted that the consideration of the user and their operations were well considered. He did mention an interesting point, being dutch himself he noted that the illustration used in the sign example of Paula Picnic reminded him more of Zwarte Piet than a Runner, mainly due to the hat. This may be counted as a cultural oversight, the illustration was from Picnic's graphic library and as such this insight should be tackled by Picnic themselves if they decide to implement the warning sign into the ePV2. Additionally the sign design allows an implementation of variation in the character usage, for the prototype this image was chosen as an example.

Dr. E. Papadimitriou

specialises in Civil and Transport safety. She was integrated in the project and how the development led to the final concept. The most interesting thing she found was the use of integrating the brand into product safety, this was a new concept for her. When asked about the reflective jacket designs, she confirmed that there was no standard for the visuals to follow and that as long as it outlines the user overall then it will be effective.

The highlighted blindspots caught her attention as she predicted that user recognition of the zone will learn over time experience. She suggested in order to speed up the public knowledge of this technology that Picnic releases a public campaign to spread awareness. The last feature she commented on was the illustration, she thought that to convey the action of delivering in the warning sign, the use of the stickman would be more universally understood than the Picnic personas. On the other hand she also understood that the brand should be consistent over the whole vehicle and concluded that these designs will also be more understanding the more the public are exposed to them.

"Runners should act like an extension of the brand, fun and friendly, less reckless. Their attitude on the road will affect all Picnic Runners."
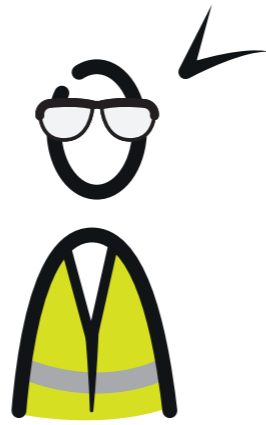
Dr. F.W. Guldenmund

""The warning signage and the blindspots will have improved usage as the public are more exposed to them. Doing a public safety campaign will sharpley increase user awareness"
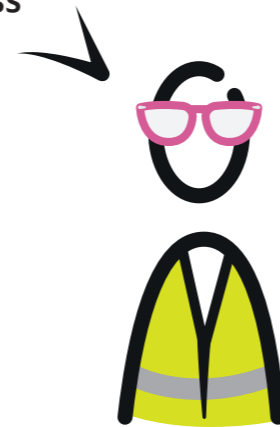
Dr. E. Papadimitriou

USER TESTING

Approach

The goal of the user testing was to use the prototype as a tool to show Runners how their job safety can be improved and find out if the proposed concept is suitable for them. The tests were done via a discussion, exposure and a follow up discussion. The first discussion allowed for an uninfluenced insight into how they perceive the current situation with the G4. After exposure to the prototype there is a chance that their perception of the G4 may alter, the discussion was conducted twice for comparison.

Procedure

The Runners were met prior to prototype exposure, given a consent form [Appx. 17] and were then asked a series of questions regarding their perspective on the current state of safety when delivering in the dark. After this brief interview, they were then introduced to the prototype one feature at a time. For each feature they were asked what they thought it was and what it does, before being told its actual purpose. A second discussion went into detail about their thoughts on the feature. Once exposed to all six features on the prototype a questionnaire was given to obtain a qualitative record of their perception on the safety situation with and without the prototype. If given consent the tests were recorded to be referred to later.

Due to privacy reasons the Runners were not directly contacted for the testing and instead done through their hub manager. This meant that the Runner experience, gender, personalities and body types were not known prior to the tests. English speaking and being active Runners at YPB hub were the only constant factors amongst the test. Due to the nature of the prototype all tests were done during the late evening on a dark street to give maximum presentation of the illumination and visibility functions.

Results

A total of 7 Runners were tested, out of these 7, 4 were experienced enough to be Runner trainers, their feedback was more considerate of other Runners, thinking about both what they would do and how a new Runner would act. There was an even mix of positive and dismissive results with the users being a mix of cautious and confident.

During the initial discussion, a lot of comments by the Runners match the insight found in the research phase, indicating a widely shared concern with delivering in the dark. Many Runners instantly mentioned the feeling of not being seen by other drivers, most were not happy with the current system, and others mentioned it is not ideal but they still need to do their job. All test notes can be found in Appx. 19.

Needs

In general there was a strong indication that many of the features are wanted by the Runners, some were more enthusiastic than others about the prototype, however, there was a unanimous indication that it is an improvement. The Runners that were trainers have been delivering long enough to have developed habits to counter the issues of evening deliveries. Some users said they don't see the need for the features for themselves, but definitely think it will be useful for less experienced Runners.
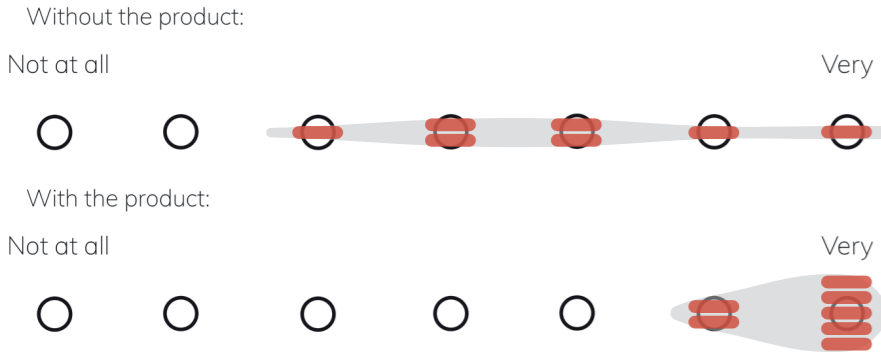
Usability

Features such as the blindspots, jacket, door lights and cargo lights don't require any interaction and as such were welcomed by the Runners as it did not eat into their delivery drop time. As for the signs these do need the user to be deployed, since the signs are both situational and not used at all times the Runners saw value in the message they communicate and were less worried about time of usage. It is speculated that the usage of these will be less than a second given the correct mechanism.
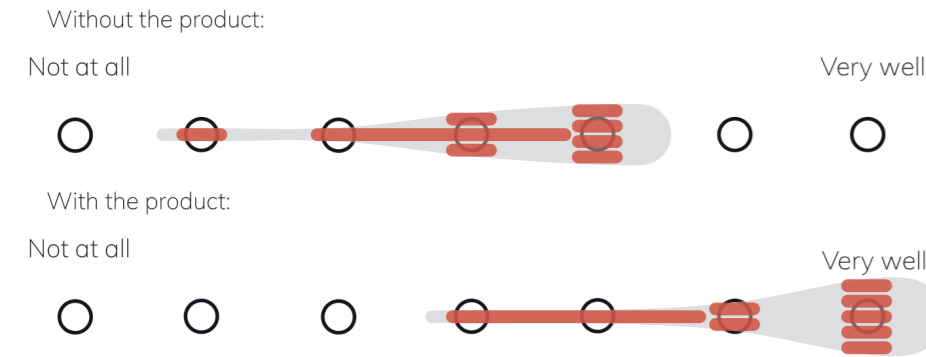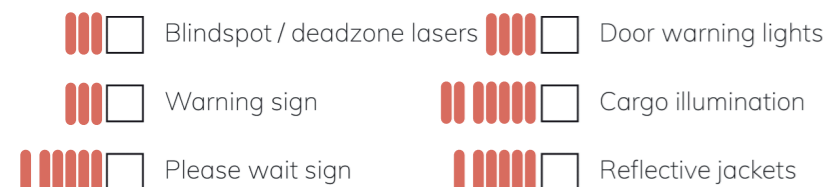
Master result sheet

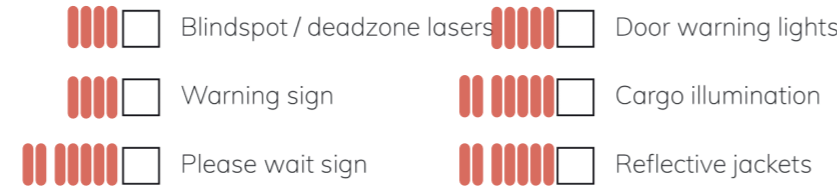## Questionnaire

How safe do you feel delivering at night?

Without the product:

Not at all   Very

With the product:

Not at all   Very

Do you think other driver can see you?

Without the product:

Not at all   Very well

With the product:

Not at all   Very well

Which features of the product would you use?:

- Blindspot / deadzone lasers
- Door warning lights
- Warning sign
- Cargo illumination
- Please wait sign
- Reflective jackets

Which features of the product would want to see in the ePV2?:

- Blindspot / deadzone lasers
- Door warning lights
- Warning sign
- Cargo illumination
- Please wait sign
- Reflective jackets

How do you feel about delivering at night currently:

How do you feel about delivering at night with this product:

Image 92: Questionnaire overall results
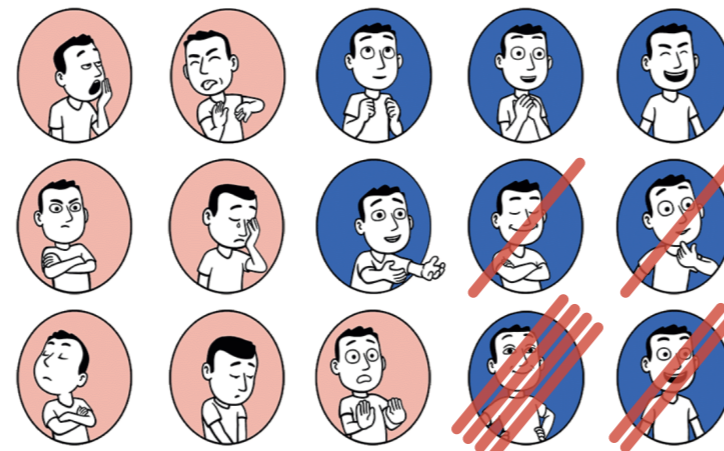
QUESTIONNAIRE

The questionnaire given at the end of the test was used to see if the Runners saw the prototype as a desired improvement upon their current Running experience. All of the questionnaire results were condensed into one sheet to show the overall clustering of results *[image 92]*. The individual answers can be found in Appx 18. The first set of questions show that Runners collectively would feel safer with the added features than the current situation. They were then asked to choose which features they personally would use and which features they'd want to see in the ePV in general, for all Runners. The answers to both of these questions share a similar pattern with the warning sign and the blindspot being the least desired feature of the whole prototype.

An emotion based question shows that with the current situation there are some Runners who already feel confident and a few who feel negatively towards it. With the prototype introduced all negative emotions have shifted to being more confident and happy about delivering at night with more emphasis on safety. These results overall show that the features in the prototype are indeed not only wanted by the Runner but will make them feel safer too. **"Any safety improvement is an improvement as long as it's fun."**

FEATURES

Blindspots

This feature was one of the least wanted by the test users, there are many factors from their feedback as to why this might be. A user recommended that the laser lines needed to be bolder and brighter to be more visible, maybe even have the whole cone filled with light. The feedback showed that many thought it would be useful but were unsure if it would be understandable to outside users; **" Cyclists who know what it means don't need it, and those who dont know won't understand it".** One trainer was afraid that Runners might get cocky with knowledge of its presence and that others should take care.

Warning signs

The other least wanted feature, the warning sign, although the value of its presence was seen by all user testers, it lost desirability from the human interaction. A common theme in this project is that Runners will always put efficiency first, even before safety. That being said, they were dismissive of an interaction that won't always be used and takes less than a second to activate, despite all seeing a need for it. A cautious Runner was very excited to see it, even though he wouldn't use it on every delivery. **"I like it, it is needed for other Runners yes, but I can't see myself using it often"**

Wait sign

This sign on the other hand was well received by the Runners as this situation often occurs and they do feel bad about blocking road access. **"It says what I want to say to waiting drivers. but I don't have the time to explain every time"** If deployable it will need to be almost an instant action. Compared to the warning sign the need for this is greater, thus the Runner seems happy to put in the second to use it for the communication it provides. 7 minutes was seen as too long for most, and they think it should be lowered to a number that also looks nicer, like a 5 or 6.

Door lights

Being one of the smaller features with little user input, the door lights were wanted. A few test users didn't see the need for it and others did but gave suggested changes to how they work. The light should be on the inside and outside of the door to warn drivers of both directions. It should also be moved away from the door latch to make it more visible that the door is open when sitting inside the cabin. One Runner said the flashing light reminded him or a dog collar, which would be more impactful to other drivers as something to avoid.

Jacket designs

The jacket prototype was shown given to the Runner to wear and then they were shown the illustrations and explained what they were. There were two sets of feedback for the jacket, one for reflectiveness and the other for the use of the illustration. The first set of feedback was highly positive as Runners have been asking for reflective clothing for a while. As for the playful illustration personas, all users thought it was a fun idea and that it suits the company, yet for them it doesn't make much difference to the job. As long as they have high-vis attributes they are satisfied with the improvement, the style doesn't phase them too much on a personal preference. *"The designs don't bother me, as long as the jackets are warm, dry and safe"*

Cargo illumination

When the lighting was turned on in the test there was an instant reply of joy as this, similar to the reflective jackets, is a frequent request by Runners to have in the ePV. To see it physically was a promising sight for them. Due to the location the Runners were able to see clearly into pulled out totes, for them this was needed as almost all test users mentioned Avocados as the most missed product during the dark. One Runner suggested that the lighting needed to be controlled more as he felt the light spill might be too much of a distraction to passing drivers. Two Runners mentioned that they have ways to deal with the current lightlessness situation, but the illumination will make things easier. *"This feature should've been added to the ePV a long time ago"*, *"Adds lots for visibility and being seen".*

PROTOTYPING QUESTIONS REVISED

PQ1: Does the prototype make Runner's feel safer?
The feedback and completed questionnaires from the user testing helps to bridge the knowledge gap for this question. Overall the Runners showed a lot of desire and enthusiasm towards the prototype when presented to them. Although the feedback varied over each of the features there was a distinct need for an improved safety experience. The questionnaire states that even at a low fidelity state the prototype already has the Runners feeling more confident and safe about delivering during the dark. I believe that if certain features were to be developed further it can make a significant impact on Runner welfare.

PQ2: Does it become safer? (qualitatively)
From the consultation with the experts it was found that the proposed changes to the ePV were indeed approved safety improvements. The experts approved that all the features are fine to implement within traffic and occupation safety regulations and trends. Compared to the current experience they believe that the found safety problems will need to be tackled as the company develops. The development of the ePV2 is the perfect chance to integrate the additional safety feature.

PQ3: Does the prototype clearly communicate safety?
For the expert, yes it does, the design is approved to work well in a traffic context with little deviation to the safety norm. As for the Runners, during the user testing they were all able to understand the use and need for each feature, this is hopeful that other road users will also be able to understand.

PQ4: Does the interaction have an acceptable impact on the droptime (<10 seconds)?
For most of the features, there is no user interaction to activate them, thus not impacting on the drop time. The warning and wait sign will have an impact. The answer is a speculation as the prototype was not a full representation of the ideal mechanics. If the signs were to be built as mentioned in the validation stage, I predict that both signs could be activated separately within a second. The testing for this was limited by the project duration.

Image 93:
Photos from user testing

Washing the ePVs

.7

EVALUATION

IMPLEMENTATION

Testing has provided conclusive evidence that over half of the designed safety features are wanted and desired by the Runners. They are also approved, by safety experts, and were assessed to be beneficial improvements to the current situation. This being said it is not up to me to make the choice to implement this proposed design into Picnic's new and current fleet of ePVs. Although the features complement each other as a system, they will still work just as well individually as Picnic may not take all features on board. This project has been done at a beneficial time in the ePV2 project, as at time of writing, the vehicle is still in development, this allows for the opportunity to integrate these proposed changes rather than using them as attachments. With most of the features additional development will be required before implementation.

Blindspots

This feature will need to be developed further before full implementation as what was made in the prototype was mostly a representation. Which is why the display of the blindspots should be redesigned by a professional vehicle lighting company in order to achieve an output that is bright enough to be visible and attract attention. This feature will also need a public awareness campaign to be held to bridge the knowledge gap to everyone who may not know that all vehicles have blindspots.

Warning signs

There is a need for it, but it is lacking the desire from the more experienced Runners. I believe that fresher Runners will want to rely on this when the situation arises. The warning sign fits the brand well and is viable for the company to implement at low costs. It can be integrated into the cargo doors and used occasionally, a car will have a safety kit in it but may never be used. This feature impacts the psychological safety and when the Runner has a need for it, they can use it. This is a precautionary safety feature, that can be deployed depending on the Runner.

Wait sign

Wanted by all of the Runners this feature, give clear communication to the other drivers, and say what the Runner dont have time to say. The message prototyped is a template for whatever Picnic chooses to use. The build of this feature is very simple and should be a permanent attachment to the rear doors, with a flap to cover it when not needed. As the sign is not a traffic safety standard it has the viability to have the design altered as the company grows.

Cargo illumination

There were many joyous faces when the test users were shown this feature. It is a long requested solution to a problem that runners have to face multiple times per shift. This is more feasible to be implemented in the ePV2 than the current G4 due to electricity usage and location of lighting on the door types, canvas vs split opening. LED lighting is cheap nowadays and a viable option for lighting. It can be highly impactful in illuminating an environment. I advise a way to reduce the light spillage out sign of the area needed by the Runner. Further research should be conducted into how the lights should be activated, but the majority of the test users didn't want it to be automatic.

Jacket designs

Reflective and high-vis materials on the Runner jacket have also been requested for a long time. With new jackets being constantly bought as replacement and for new hubs, it will be viable to feed new designs into the distribution of jackets. The blank canvas of the jacket, allows for the potential of huge variation in design being made to extend the friendly branding. Picnic has already taken this concept and put it into development, with the creative team working on new designs from scratch, with lots of food and characters in the making. Runners will soon have a new look, many won't mind the change, whilst others are looking forward to it.

Door lights

Subtly useful, these lights serve a dual purpose, to keep the doors closed properly and to make other drivers aware of the hard to see glass and black plastic extension. With little interaction needed it doesn't impact on delivery droptimes, making it a more desirable safety improvement for Runner. This option can be easily integrated into the ePV2 door design, with wiring linking the lights to run off the main vehicle power. It is a choice to be made by Picnic the rate of light flashing. In the long run a simple addition can can the company money in damages that otherwise might occur to the cabin doors.

A Runner with his ePV

RECOMMENDATIONS

Amongst all the data that was discovered about the Runners there are a few recommendations that can be made to Picnic, regarding this project and more. Apart from these recommendations there are many elements of this project that can be revised by Picnic to find areas to improve for the Runners and their customers. From what was found there are no major issues that should be tackled instantly by Picnic. The company is still young and working there has shown me that they solve problems quickly. I have experienced research findings already being addressed by the various Picnic teams in their upcoming projects.

If any of the final proposed concept features are chosen to be implemented in the future, I suggest to develop them further beyond the prototype presented in this project. This was done in low fidelity and should be used as a foundation to improve the safety experience of the Runner. I am not an expert in safety design so I recommend that with each feature that professionals in the relevant areas are consulted.

This project looked into both the Runner's physical and physiological safety, they were areas in both that can be improved. I urge Picnic to focus on the Runner's wellbeing as much as they do the efficiency of the system. A user's attitude of an experience is what defines the experience to onlookers. I recommend that the first thing Picnic should work on to connect with the Runners is a trustworthy feedback loop. Let the Runners express their perspectives and keep them updated with progress to show they have been heard. It might be useful to even get the Runners more involved with the work at the head office so that they can have an impact on their lifestyle. I hope to see Picnic take these suggestions into account as there is an obvious need to help the Runners feel more confident and safe their job.

KEY TAKEAWAY

Picnic has managed to create a highly complex and efficient delivery logistic system with many people involved to keep the gear turning. They have achieved so much in 5 years and I cannot wait to see where they will be in another 5 years. With every company there is alot to constantly consider and deal with. My project has focused on the Runner and the ePV2. The data found outlines the Runner's experience and provided Picnic with a fresh perspective. The work done in this project has shown that constant probing into the Runner experience will always return more and more valuable data to work from. I will leave the Runner flow diagram and Runner journey map posters with the distribution team, for them to fully utilise them as communication tools and inspiration. From these and this thesis they will have a lot to work towards and I am sure they are up for the challenge.

A Picnic advert

REFLECTION // PROCESS

This project followed the flow of the design thinking method. Parallel to this method the creative problem solving method was used for moments where the project hit ruts in progress. The design thinking was followed mostly for the first half of the project, after that it lingered on the define and ideate phases. The end of the project did pass through the prototype and test phases, rather quickly. This was mostly because I wanted to have the Runner's input on something more than just a concept. Their input emphasises that the system of safety features is indeed wanted and needed at Picnic.

Empathise
From the start the Runners were the main focus of the project, they were studied with many, many methods and a vast amount of knowledge was gained from them. Spending so much time with them and doing their job truly allowed me to become empathetic with them, so much so that other Picnic projects were consulting me as a Runner expert. This immersion proved to be absorbing as I found it hard to end the researching phase. After each interview I learnt more, and I felt that there were always more insights to find. A nice way to wrap up this section is that all findings were condensed into a large visual poster, for both my use and for the company's usage.

Define & Ideate
These two sections were bounced between for a third of the project as all of the research findings were organised, defined and developed into ideas to only have the area of those ideas redefined before the final ideation. This might have seemed overly complex, however, it felt like the natural way to progress with so much data to condense into one idea from such a complex system. If this was represented as an alternate approach to the design thinking method, it would look similar to *[image 94]*. During this define and ideation loop there were many times where the progression went stale, as I was surrounded by so many opportunities and directions to take that I found it hard to choose one to progress with. With the Runner as a focus and the ePV2 in mind, I ended up with a concept themed around user safety.

Prototype
Once broken free from the whirlpool of definition and ideation, a final concept was chosen. This sparked the start of the prototyping. Only a week was spent on this stage as there wasn't much time left in the project. A low fidelity prototype was created in a short time. I was annoyed that I could not get the right parts for some features to properly user test the droptime impacts. Prototyping outside and bad weather made it difficult to find fitting errors early and fix them. In the end I was content with the prototype as it was enough to have valuable feedback on and to physically show the stakeholders the concept embodiment.

Test
With such notice and so close to the project end, I was fortunate to be able to test the prototype with seven Runners. I am pleased with the users that volunteer to test, as they were a great mixture of personalities, giving both critical and positive feedback. During the discussion I didn't have set questions which mean that each Runner was being asked deviations of the same questions. One of my interviewing flaws is to preempt what the interviewee is going to say and try to complete their sentence when they are struggling with english, I should let them finish the sentence in case I influence what their statement is. Apart from that the testing went smoothly until the end, where the prototype began to fall apart, in time for the last test to finish. The result from the test gave much to talk about and areas that could be improved.

A illustration that can be found on the side of ePVs
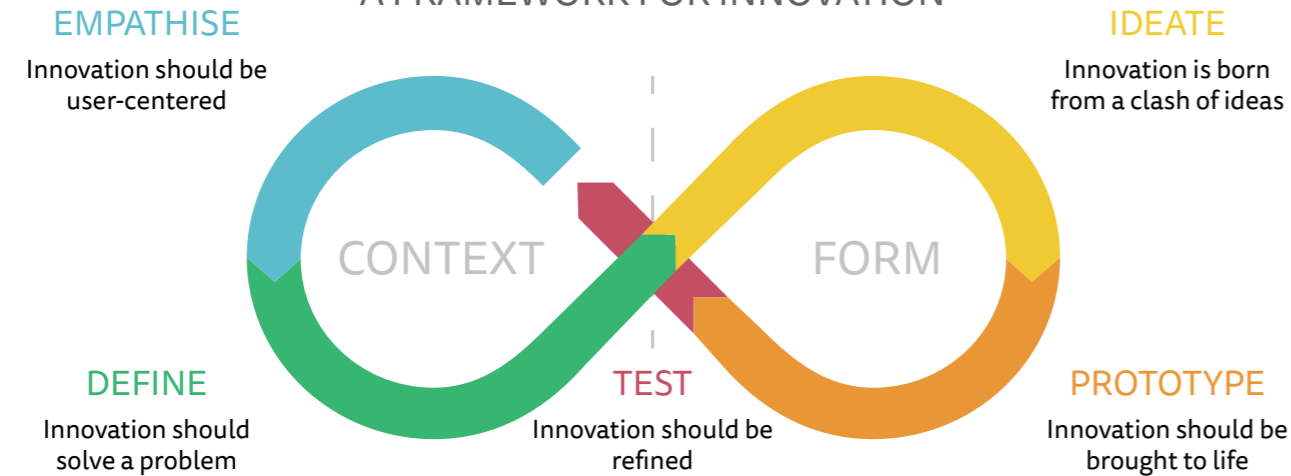
DESIGN THINKING
A FRAMEWORK FOR INNOVATION

EMPATHISE
Innovation should be user-centered

IDEATE
Innovation is born from a clash of ideas

CONTEXT

FORM

DEFINE
Innovation should solve a problem

TEST
Innovation should be refined

PROTOTYPE
Innovation should be brought to life

Image 8: Design thinking method

DESIGN THINKING
ALTERED APPROACH

PROTOTYPE
Innovation should be brought to life

TEST
Innovation should be refined

IDEATE
Innovation is born from a clash of ideas

FORM VIA CONTEXT

FORM CONTEXT

EMPATHISE
Innovation should be user-centered

DEFINE
Innovation should solve a problem
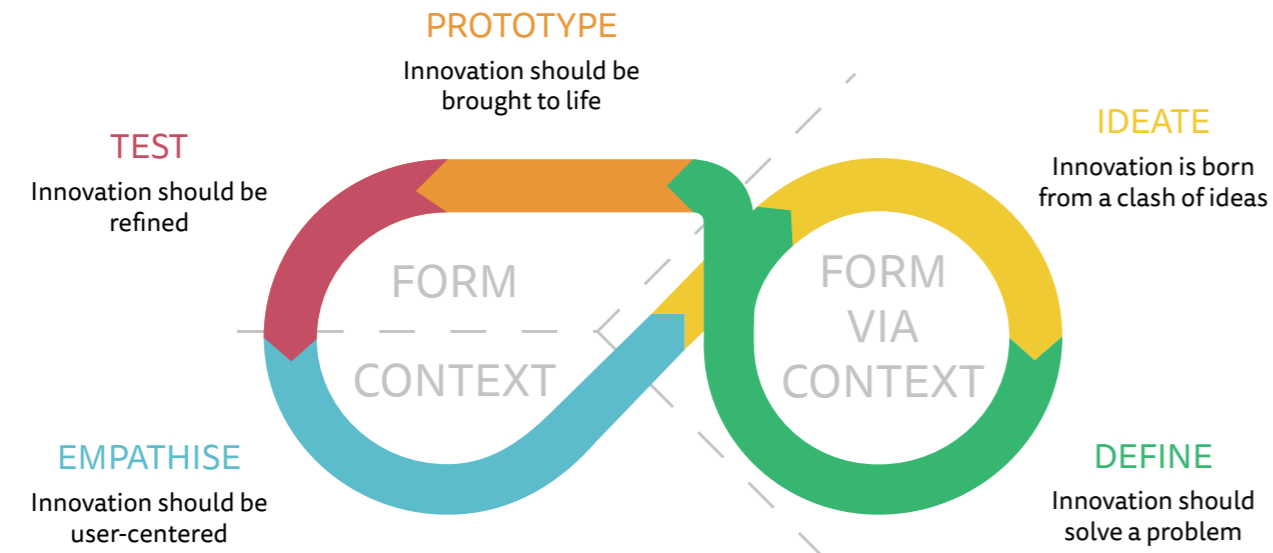
Image 94: How the design process happened in this proejct

REFLECTION // PERSONAL

Working at picnic

I have enjoyed my time working at Picnic head office. It is a very casual and young place. The colleagues there have always been willing to help and are themselves hard workers. I believe that by doing this project with Picnic that I have really pushed myself to do as much as I can to give back to the Runners and the company. I would have struggled to output the same quantity and quality of work, had this been a project without a company. Working at desks near the stakeholder and other graduates gave a constant flow of feedback on the development of this project, allowing for daily alterations. Weekly meetings gave goals to work towards. I was also glad to be consulted for company projects, and to have my research, communication tools and concept being used and implemented into the development of the company.

The Runners

The Runners are a brilliant user group who like to talk about what they do. They have a lot of insights into the company and at times can be unwilling to discuss with an unfamiliar face. Within the hubs in Amsterdam I was able to make connections with a few Runners to contact them for testing, information and to confirm assumptions of the Runner lifestyle. They are mostly young drivers, which at times can be reckless, but I hope in time, Picnic will be able to iron out the flaws and improve their work experience and attitude towards driving safely.

Methods

Throughout this project there were many methods used, almost too many. The reason that I chose to use numerous methods, especially in the research phase, was because I realised from an early stage that the context was vast and I wanted to be sure I collected data to represent all aspects of the Runners experience. Although this gave me large quantities of data, it made organising through it a monumental task, which ended up limiting the amount of time that could be spent on prototyping and user testing. Despite the short ending, I believe the

value of this project comes from the research. The overuse of methods stalled the insight finding as during this point I tried to use a VIP clustering method, rather than rely on my personal expertise in the context. I found myself needing to justify every decision with a method which caused more required time per decision.

Limitations

Throughout this project many hurdles were met and overcome with patience and help from Picnic. As I only speak English, working at a Dutch company caused communication issues and barriers to crop up on occasion. In the office this had little impact on the project, the main problem came from in context research and testing. Due to the employment requirements Runners are not required to speak English, this led to a large gap in the user group that couldn't not be interviewed for their insights. Additionally those who were interviewed and had restricted vocabularies were unable to fully express themselves.

Picnic is a massive functioning logistic system, thus organising and doing research and tests proved was met with some resistance. Having Runners meet outside of their shift time was difficult to arrange at short notice, hence why the majority of the research happened whilst they were out on their shifts. Many Runners have had issues with the head office, thus many are not willing to be cooperative.

One factor that remains abundant during this project is that the context is immense. The number of Runners is vast and each has varying perspectives on their job, so it can be hard to find problems that are common amongst all of them. Picnic is still a young company and from the amount of problems found from Runners, show that they still have areas to improve. The Picnic system is functional, but now I believe that they are at the stage to focus on the users who help the system flow. Being constantly aware of how each choice has knock on implications to the whole system, meant there was a lot of consideration with each decision.

Authour - Benjamin Collin

FINALLY..

This was a research heavy project that I truly enjoyed working on. There were moments of despair and joy, with each phase being the start of an emotional rollercoaster. I am glad I persevered as it was a ginormous amount of knowledge to take in and tackle for a solo project. With more time I would like to have gone deeper into the mind of a Runner and fully prototyped and tested my concept. It is great to see that I have made an impact at Picnic during my short time there. I felt like a valued member of the team and it was great that my ideas were already being implemented before the project conclusion. I hope to return to Picnic again one day and work on a project to finalise the application.

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ACKNOWLEDGEMENTS

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"VAARWEL!"