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Providing foodora couriers with e-vehicles for food delivery in Sweden

A case study on courier efficiency and cost savings

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Master in International Management

Supervisor:

PHD Álvaro Augusto da Rosa, ISCTE Business

November 2022



BUSINESS
SCHOOL

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Dedication

A special thank you...

... to foodora for believing in the project and for providing the investment needed to fulfil it.

... members of the logistics development team for all the support in the project.

... to my family for encouraging me to trust myself.

... to ICTE University for providing me the tools needed to complete the project. I am very grateful for my privileges and this adventure called life.

Resumo

Ao longo dos anos mais recentes, o comércio eletrônico cresceu exponencialmente. Isso é impulsionado por uma crescente procura, por parte do consumidor, de entregas rápidas e eficientes. Cada vez mais, empresas de entregas buscam alternativas sustentáveis que reduzam a emissão de carbono; e, uma das soluções é o uso de veículos movidos a energia elétrica. A utilização de veículos elétricos tem aumentado ao decorrer dos anos e, nesse contexto, eles têm sido explorados como uma solução viável para problemas de logística urbana.

Esta dissertação, procura lançar luz, através de um estudo de caso, sobre a possibilidade de mudança do atual modelo de negócios da foodora para um mais sustentável. Os dados foram recolhidos em Malmo, Suécia, onde os entregadores recebem equipamentos sustentáveis e um veículo eletrônico. O objetivo é verificar a possibilidade do investimento em iniciativas sustentáveis, mantendo rentável o custo por pedido. Também analisa a perspectiva do entregador sobre como essas mudanças impactam e são percebidas por eles. As descobertas iniciais mostram que a UTR, total de pedidos por hora, dos correios aumenta. Não obstante, o custo por pedido diminui. Entretanto, essas mudanças não foram significativas o suficiente, resultando em perdas no investimento inicial da foodora. A isso deve-se a problemas de bateria e fatores externos, como o clima. A perspectiva geral dos entregadores é que o novo modelo sustentável é positivo e gostariam de vê-lo crescer.

As observações finais são que os veículos elétricos não são adequados para o comércio rápido, apesar de os entregadores verem um maior ganho por hora.

Palavras-chave: Last-mile delivery, entrega de alimentos, foodora, veículos elétricos, Sustentabilidade, estudo de viabilidade

Abstract

Over the last couple of years the e-commerce sector has been growing exponentially. This growth is boosted through a continuous increase in the public demand for quick and efficient deliveries. More last-mile delivery companies are looking at sustainable alternatives to reduce their carbon footprint. One way to do this is through using e-vehicles for deliveries. The sustainable e-vehicles for last-mile delivery operations have been improving over the years, here they are explored as a viable urban logistics solution.

This empirical thesis, conducted through a case study, analyses the possibility of making foodora's current business model more sustainable. The data is collected in Malmo (Sweden) where couriers are given sustainable equipment and an e-vehicle. The goal is to see whether it is possible for the company to invest in more sustainable initiatives while maintaining a profitable cost per order. It also looks at the courier's perspective: what is the impact of the changes and how will they perceive them? The initial findings showcase that the UTR of the couriers increases, which leads therefore to an increase in the hourly earnings. Furthermore, the cost per order decreases. In the end these changes turned out not to be significant enough, resulting in a loss in the initial investment. The battery and weather conditions have been the biggest blockers for not reaching the targeted UTR. Though, the general perspective from the couriers is very positive.

The concluding remarks are that e-vehicles are currently not suitable for food delivery despite the higher earnings per hour.

Keywords: Last-mile delivery, food delivery, foodora, e-vehicles, sustainability, feasibility study

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Glossary of acronyms

3PL: Third Party Logistics

CBA: Collective Bargaining

Agreement CPO: Cost Per Order

DX: Rider Experience

E.g.: *exempli gratia*

Etc: *et cetera*

EU: European Union

E-vehicles: electric vehicles

H: Hypothesis

I.e. *id est*

km/h: Kilometre per hour

KPI: Key Performance Indicator

kWh: Kilowatt hour

MSW: municipal solid waste

NPS: Net Promoter Score

Q-Commerce: Quick Commerce

RQ: Research question

RSO: Regional Security Representative

SEK: Swedish Krona

STA: Swedish Transport Agency

TWU: Transport Workers Union

TWUR: Transport Workers Union Representative

US\$bn: US dollar in Billion

US\$m: US dollar in Million

UTR: Utilisation Rate or number of orders per hour

1. Introduction

The covid pandemic exponentially rose the market for food delivery as the demand for food delivery by consumers increased. Something which was considered a privilege a few years ago, quickly shifted towards being an accessible service (Chen, M, 2022:6539). The concept of gig-economy started to be an attractive job market for the unemployed. Online job platforms became the main source of income for many, however the wages and work conditions are suboptimal. It quickly became public knowledge that the conditions of the food delivery couriers were extremely poor. Many started to criticise the lack of rights within the gig economy and soon strikes increased around the globe demanding labour reforms (Quondamatteo, 2021:92). Today the discussions are slowly shifting towards the sustainable aspect of Q-commerce.

As more couriers work for gig-economy and are constantly operating within cities it raises concerns on the carbon emission this releases. The courier's vehicles are not always in the best conditions which in turn is not considered sustainable (Zamani *et al.* 2015:676).

Some companies have already started taking proactive steps towards sustainability, such as Domino pizza, for example, who rolled out a national e-bike delivery program as part of delivery efficiency innovation (Fantozzi, 2019). However more needs to be done to tackle this issue.

1.1 Foodora Sweden

Foodora Sweden entered the market in 2015. The foodora brand currently operates in Sweden, Norway, Finland and Denmark but is part of the Delivery Hero Group. Currently, foodora Sweden (hereafter called foodora) works with an operating model where all couriers (hereafter called riders) are employed but make use of their own vehicle. This counts for all riders, no matter the vehicle type they work with. Riders are offered short-term contracts with a possibility of renewal.

A few years ago the Swedish Work Environment Authorities and Labour Unions criticised foodora's method of organising their employees work as they are considered illegitimate given the many social justice concerns (Geissinger *et al.*, 2020). Ever since, foodora and the Transport Workers Union (TWU) have signed a

Collective Bargaining Agreement (CBA), which came into effect as of the 1st of April 2021 (Anxo, 2021).

The CBA increased the minimum wage of the riders, and guaranteed extra wages during weekends. Furthermore, all riders under the CBA gained access to pensions and insurance. The TWU was also responsible for setting up specific guidelines for improving the work environment of the riders. Lastly, both parties agreed on having provisions regarding compensation for vehicle maintenance and work clothes (Anxo, 2021). Nevertheless, some of these agreements within the CBA did not have any major impact on the work environment.

Currently, foodora faces numerous safety issues. The majority of these issues are related to the state of the vehicle that the riders are working on. This is especially noticeable by the vehicles lacking working lights or brakes, no or wrong insurance, no service and/or maintenance etc.

Besides compliance issues, the majority of the vehicles used by riders are not sustainable, as the vast majority uses gasoline based vehicles while working. The increased demand of the service of food delivery has also led to a large increase of gasoline based vehicles circulating in the cities. Gothenburg city has been vocal about the increase in noise and CO2 pollution caused by foodora riders (Göteborg Post, 2019).

Foodora's current business model is that before working their first shift, riders receive a starting package of equipment that is suitable for all weather circumstances as well as the vehicle that they use. The riders are then left mostly on their own to pick up a shift and start it anywhere within the designated delivery area of the city. The riders are required to wear and use the provided equipment while working as stated in the terms of foodora's employment contract. The equipment needs to be used for food transportation, road safety and marketing purposes. In case of broken or damaged equipment, the rider has to contact Foodora and collect a new item. Although it's stated in foodora's contracts that riders should wear and use the provided equipment while working, the company still faces significant cases of noncompliant riders. Examples of such cases are that the riders do not use foodora's equipment, use the competitor's equipment or work with damaged/dirty equipment that can impact food safety.

Picture 1.1 - Foodora backpack Malmo 2022



One solution to the above mentioned problems is to implement a new business model in which riders are provided with an e-vehicle and clean equipment. This is something that is currently being done with one of foodora's 3PL partners in Malmo. These 3PL's riders come into the office before every shift, where they are provided with clean gear and a vehicle from the company that is in good condition. The average performance of that 3PL is a UTR of 3.5. In comparison, Foodora's current riders in Malmo average with a monthly UTR of 3.19. (Delivery Hero, 2022a).

For this reason, the proposal of this thesis is to take a similar approach with a big focus on sustainability, using the 3PL's 3.5 UTR as a benchmark. The key difference from the 3PL partner setup is that instead of providing gasoline based vehicles, foodora provides e-vehicles to riders. This new business model also suggests that the riders pick up their equipment in office before shift, which would ensure the quality of the gear is always intact and reused for sustainability purposes.

However, food delivery companies such as foodora are reluctant to make any investment or changes as these will directly impact the profitability. The profitability is measured through the CPO. The current average CPO is 68.71 (Delivery Hero, 2022a).

For this reason, the proposal of this thesis is to analyse whether or not this new business model will have a negative impact on the CPO. With the above in mind, this thesis seeks to provide empirical data on whether implementing a new sustainable business model for riders in Malmo will see no changes to foodora's CPO.

1.2 Aim

Providing e-vehicles to all riders may be extremely costly for foodora and seeing its CPO increase. As this is not something that has been widely studied amongst platform based gig economies, the goal of this thesis is to see whether it is possible to introduce a new business model in which riders are provided with e-vehicles and foodora's CPO does not increase. Secondly, this also seeks to tackle questions of sustainability in terms of the riders' equipment and vehicles. Implementing this new business model requires a big investment from foodora, hence the need for a deeper analysis if not only the technical complications but also a pragmatic view is needed.

1.3 Scope

For this thesis a comprehensive literature review is presented followed by a case study. The case study is implemented in Malmo with a total of 150 riders. Two perspectives are considered and analysed. Firstly, all the costs related to implementing the project are calculated and subtracted from the CPO. Therefore, an increase in the riders' UTR is needed for the company not to see a loss in their investment for sustainability. The next perspective is that of the riders using the e-vehicles. This is viewed through an extensive study of both a rider experience (DX) survey and an in depth analysis of their performance. There are several operational challenges in implementing a new business model. These challenges will be discussed in the analysis, while considering other relevant topics from the literature review. Nonetheless, other related key points about sustainability are considered throughout the conduct of this project. The core goal remains to see whether it is possible to invest in sustainable vehicles and maintain a profitable CPO. Furthermore, this thesis encourages more for future research to be done.

1.4 Research questions

The study of this thesis seeks to examine the operational opportunities in investing in e-vehicles for last-mile delivery companies while retaining a profitable CPO. There are several questions that arise in this research. In order to facilitate the research, the questions are divided into 2 categories i.e., foodora and the riders

perspective. This allows for a comprehensive analysis to be conducted. As this research progresses many more questions may arise which encourages for others interested to investigate further.

Foodora:

RQ1: Can the CPO remain profitable for the company while investing in e-vehicles?

Rider:

RQ2: Can the riders achieve a higher UTR with an e-vehicle?

RQ3: What is the rider's perception of working on a sustainable vehicle?

RQ4: Do riders appreciate a less individualistic work and consider the new proposed business model as scalable.?

Despite the questions above, the main question of this research is to define whether last-mile delivery is ready and can make the push towards more sustainable initiatives amongst the fleet. Thereby, the task is to identify all internal and external demands within this project. Moreover, there are some hypotheses (H) that can be considered for the research questions presented above. The most relevant hypotheses from the author's point of view are showcased below.

H1: The use of e-vehicle will significantly increase the UTR to a point where Foodora sees no loss in their initial investment.

H2: The sustainability approach will result in a positive rider experience

1.5 Research Methods

This following subchapter is structured into 3 sections, each describing one crucial part of the research method. The first section, which is considered more of qualitative research, is to introduce the literature review. The literature review is a crucial part of the research process as it allows to formulate comprehensive understanding on what others have researched and found. It creates a clear framework on what should be thought of before conducting one's own research. A variety of references is provided in this section, which shows the on going literature that is being conducted on these topics. Secondly, a case study is conducted in practice in order to show the quantitative data. All research questions are answered by conducting the

case study. RQ3 and RQ4 relied more on qualitative data, while RQ1 and RQ2 saw the results through quantitative data analysis.

1.6 Disposition

This project paper is divided into five core sections. The first section will showcase the literature that is relevant to this research paper. The aim of the following is to shed light on the ongoing literature in regards to gig economies, Q-commerce, collective agreements and sustainability. The new proposed business model needs to have a more comprehensive framework to justify its implementation, therefore these topics were identified as the most relevant for this research. The overview provides a concrete understanding of the various problems and issues related to these topics.

The third chapter of this thesis consists of the methodology, underpinned by a feasibility study. The feasibility study provides this research with an overview of the likeliness of the case study of succeeding. An explanation and definition on the main key performance indicators is also introduced.

The fourth chapter is the analysis. All of the anticipated costs related to foodora's investment are calculated in this section. Also, qualitative data is gathered through a survey and presented.

The fifth chapter consists of the implementation stage. In this chapter, the project is put into practice for one month. Data is collected throughout the entirety of the month and afterwards presented. The results from this section will analyse the presented RQs. The final chapter will conclude with an overview of the project and also present its limitations.

2. Literature review

2.1 Gig economy

Gig economy implies a project employment model for civilian workers. Such work is performed through completing small tasks for a certain amount of time, e.g. on shifts. According to Stewart and Stanford (2017), the gig economy can be exemplified by four characteristics: irregular work schedules based on the customer demand, workers getting paid at a piece rate, work being arranged and/or facilitated via platforms and lastly gig workers providing capital (e.g. in the form of vehicles or smartphones). Kin et al. 2028 states that the gig economy is a flexible work environment and helps in achieving work-life balance as gig workers are free to choose what type of work they want to perform and where they will do it. Most gig workers are responsible for purchasing their work equipment such as vehicles and smartphones (Gupta, 2022). Krier *et al.* (2022) state that several factors lead to the choice of the vehicle for gig workers. Mainly the cost of use, convenience, physical strain and speed of travel are most important. Research shows that the vehicle choice has a strong impact on the daily experience for the gig workers in delivery jobs. Motorised vehicles get different lengths of deliveries compared to regular bikes (Krier *et al.*, 2022).

By the emergence of the platform-based gig economy, a wider debate concerning the future of work arose (Goods *et al.*, 2019). Gregory, K (2021) states that the destabilisation of traditional employment makes room for a growth in the entrepreneurial culture and the rationalisation of technology. These together are giving rise to new forms of risk and uncertainty for workers.

There are opposed views on the implications of these forms of work organisation for works and society. Some people see a lot of potential in the gig work to improve the flexibility of the labour market, while others argue that it will erode income certainty and working conditions (Goods et al., 2019). It can be argued that gig workers earn modest salaries and gig workers have very few job opportunities associated with any kind of retirement or health benefits (Gupta, 2022). Furthermore, gig workers are not legally classified as ‘employees’ which means their employers do not withhold income or social security taxes from the salaries. Newlands (2022) affirms that new migrant workers frequently choose gig work as the first entry point

on the labour market, mainly for short-term rather than as the first step of a longer gig-career. The main reason for this is that migrant workers get reduced perceptions of their employability due to language barriers, information asymmetry regarding local job opportunities and imperfect qualifications (Newlands, 2022). There are certain types of gig work that require less specialised training, including locally performed services such as food delivery (Piasna and Drahokoupil, 2021). Food delivery is booming, and the revenue in online food delivery is still increasing year over year. By the end of 2022 the revenue is expected to reach US\$1.98bn. From 2022-2027 the revenues are still expected to increase with an annual growth rate of 15.90% that eventually results in a project marketing volume of US\$4.13bn by 2027 (Statista, 2022d).

2.1.1 Gig work in Sweden

Centuries-long, Nordic countries have been known for their general acceptance and inclusiveness. This approach makes them stand out in relation to other regions and countries (Larsson and Rhinard, 2021). Sweden's migration policies are nourished with these ideals of exceptionalism and egalitarianism. This makes the country well known for the high job quality and worker protections. Nevertheless, it is a fact that Sweden also faces high levels of ethnic separation and employment differentials for natives versus migrants (Newlands, 2022). In addition, Bussi and Pareliussen (2017) state that Sweden has high thresholds to enter the labour market which requires high skill and education levels. On average, the migrants in Nordic countries are less educated and skilled compared to the natives which increases the supply of low-skilled labour. The language barriers and limited social networks seem to have the biggest impact on the labour market and make the country facing underemployment (Newlands, 2022). A common phenomenon in European countries is the activation of unemployed workers. Such programs demand employers to hire and attempt to influence the willingness to hire and train or guide unemployed groups (Castillo, 2019). Sweden's labour policies are, in line with this European phenomenon, mainly focussed on so-called 'managed migration'. This approach focuses on the economic integration of migrants with the main goal of getting them more self-sufficient (Newlands, 2022). However, despite the managed migration approach, Sweden has the biggest gap in employment rates between migrants and

natives in the EU where the foreign-born workers are highly represented in different types of unskilled work.

Furthermore, specialists argue that the country has become the biggest separated labour market with a racialized underclass (Newlands, 2022).

Ethnic minorities on the labour market in Sweden most often tend to choose online platform work, mainly in urban areas. Amongst these platform workers there is an overrepresentation of young men (Kakaria, 2022). With less than 5 percent of the population earning more than half of their income in this industry, the platform economy in Sweden is still fairly small compared to other markets. However, the numbers have been growing exponentially and it is expected that in the coming five years, 20 percent of the workforce will be employed in the platform economy (Freelance Movement, 2022).

2.2 Quick commerce

By using food delivery services, customers can hire delivery workers to pick up their food on their behalf (Chen M, 2022). Over the last years, food delivery has become an easily accessible service for consumers rather than a privilege. By simply swiping on a smartphone, customers can order food on demand via delivery platforms (Chen M, 2022). According to Gregory, K (2021) there has been a huge emergence in new lastmilers since the pandemic. The success for this industry is simply: speed (Vembu, 2021) and immediacy (Kakaria, 2022). Speed and convenience are fast becoming attractive to consumers, giving the increase to Quick Commerce, often known as Q-Commerce (Vembu, 2021). The Q-Commerce segment focuses on grocery delivery via last-mile delivery from supermarkets or via platforms with ghost stories such as foodora market, Getir and Gorillas (Statista, 2022a) and revolutionised the e-commerce grocery business (Kakaria, 2022). The main target group for such services are high-income households in urban areas who value convenience over price (Kakaria, 2022). Customers are price-savvy and willing to try all of the options that are available for them (Lee, 2022) Most players in the market aim to deliver on demand in 10-30 minutes (Statista, 2022a; Kakaria, 2022).

Research of Statista (2022d), shows that by the end of 2022, the Quick Commerce segment is expected to reach a total revenue of US\$91.22bn worldwide.

When comparing the different global markets, China is expected to generate the most revenue with US\$47,680.00m in 2022. The global revenue is even expected to significantly increase over the next five years. By 2027, the global market volume of Quick Commerce is expected to reach US\$185.10bn, which is an annual growth rate of 15.20 percent. The total number of users worldwide is forecasted to be 789.1 million by 2027 (Statista, 2022d).

Kakaria (2022) expects that the promising growth in the Q-Commerce sector will go hand in hand with:

Broadening to more categories. Examples of these categories are pharmaceuticals, fashion, cosmetics and electronics. Currently, some players have already shortened the delivery time of medicines, however more work is required to gain profitability.

Focusing on sustainable growth. To keep growing and maintain the economics, it is crucial for Q-Commerce parties to improve the basket size and average order value by customers, drive higher order frequencies, increase the number of deliveries per hour and maintain the delivery fees. These factors go hand in hand with investment in technology, warehousing, logistics and delivery teams. To optimise the costs, resources are more often shared between food delivery and Q-Commerce parties as they typically have a similar target group.

Balancing speed and sustainability for long term success. Speed is the most important factor of Q-Commerce, but can never clash with safety of the delivery partners, so-called riders. Companies need to recognize the bottlenecks and ensure safety of human resources in order to stay successful. The business will sustain if everyone in the segment is incentivized, not only the customers (Kakaria, 2022).

2.3 Collective agreements

There has been a lot of focus on the food delivery industry for the past years, and this includes the legal side. The conditions for the food delivery riders became public knowledge and criticised with the lack of rights within the gig economy (Quondamatteo, 2021). Strikes and labour actions by food delivery riders are increasing around the globe. In China a lot of workers have been very angry with the way platform companies control labour (Schoenberger, 2021). Also in Italy,

numerous strikes took place and resulted in the first collective agreement that got signed by the main unions and a large food delivery company. This collective agreement makes the food delivery workers feel recognised as employees with all rights (Quondamatteo, 2021).

According to Brameshuber and Boto (2022), various countries are concluding collective agreements for employees and non-employees at company or at branch level. They state that gig workers, such as food delivery riders, are slowly accessing negotiations that in the past were only available for employees. Stone (2017) states that unions are based on the assumption of ‘regular jobs’, which refers to jobs where employees have a regular payroll employment. This approach clashes with the various forms of on-demand work that are rising nowadays. One of the most difficult issues for labour laws in the gig economy are the workers that choose their own hours and provide their own tools (such as vehicles). The companies that work with gig workers claim that such workers are independent contractors and not employees. However, gig workers on their side are subject to the selection, direction and discipline of their employing entity (Stone, 2017). The economic incentives of gig workers are affected by computerised evaluation and rating instruments which motivates the workers to outperform each other while working in-app (Schiek and Gideon, 2018). These features of the gig economy lead to lots of pressure on the gig workers to always be (over) productive and work more hours, which eventually leads to increased earnings (Schiek and Gideon, 2018). Nowadays, several federal court cases are pending on whether gig workers are employees or are considered to be independent contractors under federal employment laws (Stone, 2017). If the case is resolved in favour of the employee status, the flexibility of the workers will be impacted. Think about examples of working time and freedom to work for more than one service (Stone, 2017). The labour market challenges of the gig economy could cause a comeback of collective bargaining

as an instrument to solve the social and economic conflicts. Collective agreements ensure a minimum level of protection for people who work in the platform economy and are a must (Brameshuber and Boto, 2022).

2.4 Food delivery in Sweden

Research by Ovin (2021) shows that since the global pandemic in 2022, food delivery has been the fastest growing of all categories online in Sweden with around 90 percent year on year growth. During this period, consumers older than 45 years stepped into the category online and the customers that were already active on such platforms started ordering more. The majority of food delivery users in Sweden are between the ages of 25-34 years and both male and female customers are more or less equally represented (Statista, 2022a).

The Swedish meal industry segment can be divided into two different segments. The first one is the so-called Restaurant-to-Consumer Delivery. Within this segment, the delivery of meals are carried out by the restaurants themselves. The order can still be placed through platforms such as foodora or directly through the restaurant's website. In the second segment, Platform-to-Consumer delivery, the platforms (e.g. foodora) take care of the delivery process with their own drivers. The total projected 2022 revenue for these two segments combined is US\$379.50m. Until 2027 the revenue is expected to grow another 11.85 percent, resulting in a total volume of US\$664.30m with a total of 5.5 million users (Statista, 2022b). The Restaurant- to-Consumer Delivery is expected to have the biggest share in this revenue, with a total of US\$465.10m by 2027 (Statista, 2022c).

According to another research conducted by Statista (2022a), the biggest potential in the delivery sector can be found in the Quick Commerce market. The average revenue per user in this sector has always been higher compared to meal delivery, and the revenue is expected to even grow significantly further over the next five years, and is forecasted to reach a revenue of US\$371.30m with 1.5 million users in Sweden by 2027. This is a growth of roughly 11.83 percent over five years (2022-2027) (Statista, 2022a). Surprisingly, the number of users has always been higher within the meal delivery sector and is expected to stay larger than the number of users

of grocery delivery.

2.5 Sustainability

Within the last 20 years, data analysis shows a steady increase in the EU freight transport. The web market in combination with globalisation have led to significant growth in transport. Products can be produced anywhere, travel all around the world and most of them are eventually delivered to cities (Ranieri *et al.*, 2018). Within the same period of time, we have also seen increased attention to last-mile transport which mainly takes place in dense urban areas (Kin *et al.*, 2018). The so-called “last-mile” is the last part of the supply chain and currently is the bottleneck of e-commerce logistics. Typical features are small shipment size, high delivery frequency and speed (Kervola *et al.*, 2022). The most common way of transporting goods in the last-mile is via the road (Ranieri *et al.*, 2018). Goods mainly get delivered by motorised road vehicles, mostly by small trucks and vans (Kin *et al.*, 2018). Due to the large number of people and high rate of deliveries in these densely populated urban areas, scientific literature states that the transport sector wears and tears with externalities such as air pollution, climate change, noise pollution and accidents (Ranieri *et al.*, 2018). Last-mile is also responsible for an unbalanced proportion of the total transport cost within supply chains. The physical constraints of the urban environment cause increased difficulties for transport companies (e.g. congestion and a lack of unloading zones) and makes it costlier to deliver in urban areas (Kin *et al.*, 2018). In addition, most of the vehicles used in last-mile are engine powered and therefore require oil (Ranieri *et al.*, 2018).

All of this poses major economic and environmental challenges for the fast growing retail e-commerce, which grew 28 percent in 2020 and is expected to grow by another 50 percent from 2020-2024 (Kervola *et al.*, 2022). Currently, pollution in urban areas is already a problem but with the growing population in combination with the increased demand for last-mile delivery it is expected that the air quality problems in cities will further increase (Ehrler *et al.*, 2021). It is estimated that at the moment one third of the urban traffic is commercially motivated (Ehrler *et al.*, 2021).

CO2 commissions are not only caused by vehicles, the textile industry also

has a great impact on these numbers. The improved living standards and the growing global population caused an enlargement in textile production and consumption (Zamani *et al.*, 2015). The biggest environmental impact comes from cotton- and other fibres production. The extensive use of these fibres in fast fashion is creating massive textile waste (Peters *et al.*, 2019). According to the European Commission (2022), 5.8 million tons of textiles are thrown away on a yearly basis in the EU. This equals approximately 11 kilograms per person. Zamani *et al.* (2015) state that only 25 percent of all textile waste is collected by charity organisations or other companies with the end goal to reuse or recycle, the rest is sent to landfills or municipal waste incinerators.

For the production of textiles made of synthetic fibres, a lot of microplastics are being used. The European Commission (2022) estimates that about 60 percent of the fibres used in clothing are synthetic and this number is still increasing. The pollution of these microplastics has a tremendous impact on the environment, mainly on the oceans and its sea life.

Developing recycled cellulosic materials for production is something that multiple industrial researchers are aiming to develop, but seems to be a challenging project due to the need to handle mixed waste streams (Peters *et al.*, 2019). Fibres are often mixed with other materials,

e.g. polyester mixed with cotton. Moreover, the frequent use of elastane in products, that is used to increase the functionality of the product, pollutes the recycling process of textile (European Commission, 2022). The reuse of the products in their original form seems to be a more feasible option to reduce waste in the short term. This can be done via secondhand shops and more informal charity systems (Zamani *et al.*, 2015). Furthermore, extending the lifetime of textile products is a very effective method to drastically reduce the impact on the climate and environment. The main reason for customers to throw away their textile products is the appearance of small failures in the quality of the products, e.g. broken zippers and colour fastness. Better quality and increased durability will lead to a longer use of the products by customers, and at the same time support the circular business model of secondhand and repair (European Commission, 2022).

Making a larger crowd aware of the environmental challenges can be done by sustainability marketing. This is a powerful tool that can ‘shift’ organisations and

customers towards sustainable behaviour by using feelings, emotions, cognition and addressing the issue of the attitude-behaviour gap (Whittaker, 2021). Whittaker (2021) states that the goal of sustainability marketing is to encourage consumer behaviour to take actions that result in decreased environmental impacts and use of resources.

2.5.1 Electric vehicles

To reduce negative environmental impact from the last-mile logistics on the environment (e.g. increased CO₂ commissions), many new technologies and innovative solutions have been introduced (Kervola *et al.*, 2022). Especially the search for alternative energy options has become a priority task. One of the best solutions is the use of vehicles that are more environmentally-friendly, for example electric vehicles (Iwan *et al.*, 2021:103). In the last few years, there has been great progress in the use of electric vehicles (Iwan *et al.*, 2021:103) as use cases have reflected that electric vehicles are one of the possible approaches to reduce local emissions of distribution in general (Ehrler *et al.*, 2021). In 2011, the European Commission declared two specific urban goals to be achieved by 2030. The first goal: halving the use of conventionally fueled cars in cities. The second goal: Essentially CO₂-free logistics in major urban centres (Siragusa *et al.*, 2022). Iwan *et al.* (2021) state that by 2040, the market of Light Battery Powered Electric Vehicles and Plug-in Hybrid Electric Vehicles has increased to 55 percent.

Besides the positive impact of electric vehicles reducing the local emissions, some obstacles have been identified. Electric vehicles have higher purchasing costs compared to vehicles powered by a regular internal combustion engine. Furthermore, low autonomy of batteries and poorly developed charging infrastructures require long charging times (Siragusa *et al.*, 2022). However, even when considering the limitations of electric vehicles, they still form a feasible option for short-distance trips with a low daily driving range in urban areas (Siragusa *et al.*, 2022:23). According to Binetti *et al.* (2019) more than 25 percent of all goods and 50 percent of all light goods in European cities can currently be handled by cycles.

Back in 2019, Domino's rolled out a national e-bike delivery program as part

of delivery efficiency innovation. The program allowed the pizza chain's delivery drivers to choose a pedal motorised e-bike instead of driving a car or riding a traditional bike to complete deliveries. After a number of tests in different stores, an improvement in the overall delivery and service could be seen. Furthermore, the effects of labour benefits could clearly be seen as the stores were able to hire from a wider pool of candidates, including people that did not have a car or driver's licence. All in all Domino's concluded the e-bikes have been a game changer as they save money, provide better service, increased the hiring and maintained a happy workforce (Fantozzi, 2019). The above mentioned can be underpinned by the research of Krier et al. (2022) who conclude that participating in the financing of the delivery workers' vehicles appears to be an interesting solution to meal delivery companies.

2.5.2 Waste

The fast growing popularity of e-commerce also negatively reflects the increment in the amount of waste of express packaging (Hao, 2021). Research by Kim *et al.* (2022) shows that online shopping creates 4.8 times more packaging waste than offline shopping with the same amount of spending. Online food delivery, according to Niu *et al.* (2021), does not only deliver food but also extra waste. Most waste comes from plastic containers, utensils and other single use items (Niu *et al.*, 2021). The growth of packaging waste blew up during the COVID- 19 pandemic and came with a wide range of direct and indirect environmental consequences (Pinos *et al.*, 2022). The packaging materials mainly include packaging boxes, packaging tapes and internal fillers. Waste problems from this express delivery packaging can be related to excessive packaging, the use of non-recyclable material and the low motivation of consumers to recycle (Pinos *et al.*, 2022). When it comes to food delivery, the massive use of single-use plastic packages has the biggest impact and makes the online food delivery industry contributing with nearly three hundred thousand tons of plastic worldwide (Niu *et al.*, 2021). Currently, customers take no notice of the so-called "hidden environmental cost" when they order food online. At the same time, the restaurants on the food delivery platforms are just focused on the financial benefits and don't take the environment into consideration either (Niu *et al.*, 2021). According to Niu *et al.* (2021), the significant economic impact of the food delivery industry hurts the environmental performance and they therefore

recommend that both the online platforms and their partners, such as restaurants, need to seriously consider improving the sustainability in their business.

2.5.3 Sustainability in Sweden

Over the last few years, the identification of environmental technology as a central component of Sweden's economic growth has become more explicit with many efforts to promote the concept of sustainability in general (Mejia-Dugand, 2016). Since 2009, the Swedish government has had the national goal to achieve a fossil fuel independent vehicle fleet by 2030 (Mutter, 2021). This gave room for the policy to be publicly debated, with as a result that in 2012 a financial incentive for cars with 'very small' (below 50g per kilometre) CO₂ emissions was enacted with a total amount of approximately 4000 Euros (Jansson *et al.*, 2017).

Even though the number of electric vehicles in Sweden is increasing, the adoption rate is still slow in comparison to other similar countries. What stands out is that there is a significant variation in the adoption rate of electric vehicles across Swedish municipalities, despite the fact that all financial incentives for these vehicles are the same (Egnér and Trosvik, 2018). Egnér and Trosvik (2018) state that in order to reach the target of a fossil fuel independent vehicle fleet by 2030, the government should invest more resources in detailed information about driving forces affecting the adoption of electric vehicles. The 2030 goal could, according to Mutter (2021), be seen as a first step towards the intention of achieving a net zero emissions of greenhouse gases by 2050. Even though the target most likely won't be reached, it is likely that in the coming years more countries will follow Sweden by providing similar targets and policies to encourage renewable fuels (Mutter, 2021). Mutter (2021) addresses that internationally electric vehicles are still a promising tool towards achieving the fossil fuel free future.

In Sweden, electric vehicles are often considered as a key sustainable technology due to the efficient engines and the non-fossil sourcing of the Swedish electricity supply (Mutter, 2021). Since 2018 the Swedish mix of electricity sources has been divided into 41 percent nuclear power, 39 percent hydropower and 10 percent wind power (Mutter, 2021). In 2022, the country reached a total of 398,178 electric cars which was in October that year 8 percent of the total number of cars (Elbilstatistik, 2022). The charging infrastructure for electric vehicles is another

important factor (Jansson *et al.*, 2017:176). The number of public electric charging points have increased with a total of 20,035 in October 2022 (Elbilstatistik, 2022).

Looking at the numbers of textile production in a wealthy country like Sweden, it can be concluded that consumers use 22 kilograms of textile per person, per year. The used textiles are most often used for landfill or incineration with energy recovery (Peters *et al.*, 2019). According to Zamani *et al.* (2015) it can be assumed that the majority of the textile waste in Sweden is treated with the main disposal route of municipal solid waste (MSW). In 2011, 51 percent of the MSW ended up in energy recovery. Zamani *et al.* (2015) describe this method as “*a technology where combined heat and power co-incineration plant with advanced flue gas treatment based on the Swedish Waste Management Environmental Assessment model.*” In the same year, 33 percent of the MSW got recycled into materials. Zamani *et al.* (2015) explains this technique as “*the practice of taking reusable textile waste and transforming it into a new product.*” Textiles are washed and dried first and after that reusable parts of the textile are separated manually, cut and sent to a sewing machine to create new products (Zamani *et al.*, 2015). The remaining 14 percent went to biological treatment and just 1 percent to landfill.

3. Methodology

The previous section offered a conceptual framework, which allowed for in depth various topics related to gig economies. Various issues related to the riders work conditions and satisfaction levels working on online job platforms were also presented.

The methodology will start with going through all the relevant KPIs that are needed for the analysis. This is an important step in order to evaluate the success of the project. Once the definitions are presented, a feasibility study is presented where two possible scenarios are introduced and later analysed. The scenario which poses the least risks and the best possible outcome will be used in the implementation phase of this project. The next step will be to introduce the different stakeholders of the project in order to have a clear understanding of how they contribute to the overall success of the project. Lastly, in the final section of the methodology specifics how the project is to be implemented are introduced. This includes the proposed time frame of the implementation and data gathering. In this section, it will also be explained how the data collection will be done. This methodology will be the framework used to answer the research questions at hand.

3.1 Feasibility Study

For this methodology a feasibility study is selected as it is an effective method in analysing new business initiatives. It gives a good overview of the potential success of the project by deep diving into the expected cost and evaluates the level risk of fulfilment. On another note, alignment and feedback gathering with the different stakeholders is a key aspect to this method (Kenton W. 2020). In the upcoming chapters, the feasibility study will analyse two scenarios in which foodora offers e-vehicles to the riders in Malmo. Every alternative brings different angles to look at. Scenario one and scenario two are the attached attributes. Every scenario brings different challenges that will be explained thoroughly in the methodology and later implemented in the analysis.

The first step in the proposed feasibility study consists of identifying and

defining the key performance indicators that will be used to measure the success of the project. As it was showcased in the literature there are several external fixed costs in every project hence the next subsection presents the predicted fixed costs that are most likely to occur during this project. The different scenarios proposed for the project are then presented explaining in depth how they differ and how the fixed cost applies to each one of them. The next step in the feasible study showcases a comprehensive stakeholders introduction and analysis. This analysis is done from the delivery company's perspective. This chapter concludes with describing the test operations and the data collection process.

3.1.1 Key Performance Indicators

There are several ways to measure the outcome of a project, however for this one the following have been selected. The KPIs that are argued are best suited to measure whether this project is a success or not. For the following methodology the different KPIs that are going to be used in the analysis need to be defined. On top of defining the KPI studied, we will look at how they intertwine and can have an impact on one another.

3.1.1.1 Defining the UTR and CPO

The UTR is the average number of orders a rider can do within an hour.

$$\text{Total orders} / \text{Total hours worked} = \text{UTR}$$

A higher UTR on a rider results in higher rider earnings. To put into perspective: the lower the UTR on a given rider fleet, the more riders are needed to deliver X amount of orders. With a higher performing rider fleet, with a higher UTR, less riders are needed to deliver the same X amount of orders. There are numerous factors that can influence UTR such as distances, speed, weather, vendor and customer behaviour, etc. The UTR has a direct impact on the CPO which is explained below. The CPO is directly linked to the profitability of most last-mile delivery companies. The lower the CPO the higher the profitability. There are several factors that impact the CPO such as the rider payment model. The CPO in this case is considered a variable cost as it will fluctuate depending on the UTR of the riders.

3.1.1.2 Rider experience

The riders will be approached in two different circumstances for this project. The first time will be to identify whether or not they would be interested in trying the new business model which provides them an e-vehicle. The first survey will also seek to shed some light on whether the current rider fleet is in possession of driver's licence as this is something that will be required to use the e-vehicles. This survey will also be used in the selection of which riders are to participate in the implementation of the project. The second time will be during the project implementation. Their experience on this new business model will be monitored through another survey. The rider experience (DX) is measured through monthly surveys which are grouped and categorised in a Net Promoters Score (NPS). The NPS measures the level of satisfaction of the rider on the job. The NPS is calculated on a scale from -100 to 100, with the best outcome being 100. The score is calculated based on the total group divided by the responses. This number then subtract the percentage total number of detractors received from the percentage total of promoters. The result of this equation is the NPS.

The NPS of riders using the e-vehicles will be compared to that of the regular riders that are working on their own vehicle. This will define the riders appreciation of the new business model and working with a provided e-vehicle. In both cases, surveys will be used as a source of data gathering on which qualitative data on the success of a project will be analysed.

3.1.2 Measure instruments (Fixed Cost variables)

To calculate the financial impact of the different scenarios, various affected cost outlets have been identified in **table 1.3**. In total, two categories are in place: the fixed costs and variable costs. All cost outlets are applicable for both scenarios, although the total cost differs per scenario due to the amount of vehicles needed for each.

Table 1.3 The Fixed and Variable costs

Fixed cost	Variable cost
e-vehicle	CPO
Administration cost	
Parking	
Equipment savings	

The above **table 1.3** identifies the fixed and variable costs that are related to the project. The first fixed costs are the e-vehicles. Finding a suitable e-vehicle partner which offers a sustainable option and is suitable for last-mile deliveries, will be one of the steps of this feasible study. Once an established partner is chosen the cost related to leasing these e-vehicles will need to be calculated. As these e-vehicle are going to be electrical, another cost to consider is the cost of charging, hence the cost of electricity. For the purpose of this project, a fixed benchmark for the price of electricity per kWh will be taken and be considered a fixed cost. The total cost of leasing is going to depend on the number of e-vehicles needed for each scenario. However the e-vehicles are considered to be a fixed cost as it will be a recurring monthly cost affecting the CPO.

The next fixed cost variable to define is the administration cost. The extra costs for personnel and time that are needed at the rider hub for equipment and vehicle handling can be referred to as administration cost. The estimated hours needed for the administrative costs are going to be determined based on the operating hours the e-vehicles will be on. The cost will be calculated based on foodora payments in regards to extra work. The administration cost is easily justified as a fixed cost as the cost is based on the total hours needed for the administration work which is going to be recurring on a monthly basis.

The first fixed cost to consider is the parking spaces needed to accommodate all the e- vehicles for the project. Currently, foodora has just one operation rider hub available in Malmo which currently has 10 parking spaces. In case more vehicles need to be parked, foodora has to look into external parking possibilities. Parking is considered a fixed cost as it is a monthly recurring cost based on the amount of parkings needed which influences the CPO.

The new proposed business model will see riders picking up their equipment at the rider hub and returning it when their working shift is done rather than having to take it home. By washing and using the same equipment for multiple riders, the cost of purchasing equipment on a monthly basis for foodora should decrease. Taking into consideration the total amount of equipment spending for Malmo in 2021, rough estimates are going to be calculated on how much potentially be saved on a monthly basis. This final fixed cost is considered a saving where foodora should see a positive return on investment, month over month.

3.1.3 Proposed scenarios

In the following subsection, the different scenarios proposed are introduced. These scenarios will utilise the same new business model introduced in the introduction however the key difference is in the number of e-vehicle provided. The e-vehicle distribution is based on the average total hours worked by riders that fall under the CBA in Malmo.

For scenario 1 the proposal is to pilot on a smaller scale while scenario two will be on a much larger scale where all riders are included. The fixed costs presented above will also vary depending on the scenarios. Finally the variable cost will also fluctuate depending on the scenarios.

The first scenario, on the smallest scale, is most likely the outcome with the least amount of risks due to the smaller investment needed to realise the project. For this scenario, the option will be to operate a pilot of the new business model. A total of 10 e-vehicles and 20 riders is recommended to fulfil this scenario. This set will provide a large enough data in order to critically assess the successfulness of the project. Taking into account the lower number of e-vehicles, the fixed cost associated with parking will be a cost of 0 as all e-vehicles can be parked in the current rider hub. A total of 10 parking spaces are currently available at the rider hub. The cost in equipment decrease is very minimal for this scenario due to the low volume.

Scenario 1 is proposed to run for a period of 1 month in order to collect the data needed to evaluate the outcome.

Scenario 2's proposal is to have all riders in Malmo using an e-vehicle while they work a delivery. This is considered a scale up of 40 e-vehicle. Although this does not reflect the total number of riders in Malmo it does cover the maximum

number of riders working at any given time during the day (Delivery Hero 2022b). When looking into this scenario, the following impacts of the measure instruments should be taken into consideration. As mentioned above, the current rider hub only accounts for 10 parking spaces therefore an additional 30 parkings is needed to be found in order for this scenario to be realistic. Due to the larger volumes in this scenario compared to scenario 1, there will be expected cost savings on the equipment. When all riders in Malmo start using shared equipment, foodora won't have to spend as much on purchasing equipment on a yearly basis. The cost of leasing the e-vehicles will be higher than that of scenario 1 as there are simply more. Scenario 2 is proposed to run for a period of 1 month in order to collect the data needed to evaluate the outcome.

In the next chapters each of the feasibility of these scenarios succeeding will be presented through a best, break even and worst possible outcome. This will give a good overview whether the projects can be implemented and which one is most likely to succeed.

3.1.4 Stakeholders

This next subchapter presents the different stakeholders involved in the project. This is a crucial step in any feasible study in order to have a better understanding of how it can impact the project. There are a total of four identified stakeholders, each one of them an important player for the project's success. In the following paragraphs the stakeholders will be presented in depth and they are the following: Foodora, Cake, Transport Worker' Union, Riders.

3.1.4.1 Foodora

Foodora is an important stakeholder in the project as the company will be providing all the investment needed for this project to be realised. The investment is agreed given the project presents a best outcome, break even outcome and finally a worst case outcome for all scenarios. Foodora is also particularly interested in understanding whether the proposed new business model can achieve a possible lower or break even CPO.

3.1.4.2 Vehicles

The next important stakeholder is the partner that will be involved in leasing the e-vehicles for the project. CAKE which can be the provider of e-vehicle for foodora's bike and moped fleet. CAKE is the desired provider for the e-vehicles that are to be used for this project. A partnership with them on how many e-vehicles needs to be established. For this reason it is crucial that they are kept in the loop about how the riders are experiencing working with the e- vehicle. Given that if the results are proven to be successful CAKE needs to be ready to upscale in case of positive results. What is expected from the project is concrete feedback on how the e-vehicles are performing. This is in terms of battery life, rider experience for use of delivery.

3.1.4.3 Transport Union

According to the CBA all business changes that impact bike or moped riders need to be negotiated and approved by the TWU in which foodora has signed a collective bargaining agreement. Without their approval this project is impossible to initiate. Therefore, presenting the project and conducting a proper risk assessment will be required.

3.1.4.4 Riders

The next and arguably most important stakeholder is the riders. Before beginning with any sort of investment or implementation it is crucial to know whether or not our riders would be willing to change to a different business model than the one they are currently working with. As much of the literature has shown, many choose to join online job platforms due to the flexibility of the job (Piasna and Drahokoupil, 2021). This new proposed business model might be seen as a loss to what is valued most in these types of jobs. As previously mentioned, foodora's current business model is that all riders start their delivery shift within a given starting zone within the greater delivery area. The proposed new business model in this project will see the couriers lose that flexibility as they will be required to start their shift at the rider hub. This is because the rider will be picking up their e-vehicle and their equipment before starting their shift.

3.2 Data collection and Test operations

The chosen timeframe for the pilot project will be over the course of one month. The aim is to launch the project during the month of October 2022. During this month the selected riders for the project will be working on the e-vehicles. The reasoning behind choosing one month is that it will give a large data sample. Considering that there might be a small transition period, with the couriers getting used to the new business model and to familiarise with the new e-vehicle they are using, having a month gives a decent buffer to cover this transition period. The implementation for the project will be held in the southern city Malmö, Sweden's third largest city.

The success of the implemented scenario will be mainly evaluated on the rider's average UTR. This will be done using Foodora's internal data systems. Secondary data will be collected in terms of evaluating whether the fixed cost fluctuates.

Finally the last factor that will be evaluated will be the DX survey in which riders will evaluate their experience and satisfaction with the new business model.

4. Information presentation and analysis

In the previous chapter a feasibility study was presented which introduced 2 scenarios that are going to be analysed in the upcoming paragraphs. The goal is to identify and calculate all the fixed costs and the variable cost presented in the methodology and apply them to the different scenarios.

The following chapter is divided into several different sections. The first section of this chapter seeks to determine the interest of riders in participating in the project. This is done through a survey which is sent out to all riders in Malmo. This step is crucial in determining whether the riders are first willing to use an e-vehicle and change their way of working, through the new proposed business model. This proposed change will see riders lose some sort of flexibility on the job, however the hypothesis is that their overall earnings will increase which will be reflected in a higher UTR. The next subsection will shed light on the requirements needed to apply this change from the TWU, the labour union with which foodora has signed collective bargaining agreement with. Any changes that directly impact the riders have to first be negotiated with the TWU and therefore having an understanding from their side of what is needed to fulfil this project is a requirement. This will be done through a risk assessment which helps identify any potential issues related to the desired changes.

The next section will be an in-depth-analysis on all calculations of the fixed costs. The first one that is studied is in the e-vehicles that are to be leased for this project. This is followed by the calculation of the administration costs and finally all the cost savings that can be made through the equipment by applying this new business model. Once all the fixed costs have been calculated, the focus is shifted towards determining the estimated cost of the CPO for a higher UTR. This is the variable cost as the CPO will vary depending on the performance of the riders using the e-vehicles. The hypothesis is that if the riders using the CAKE's e-vehicles reach a UTR of 3.5 or higher, foodora will see a positive return on their investment.

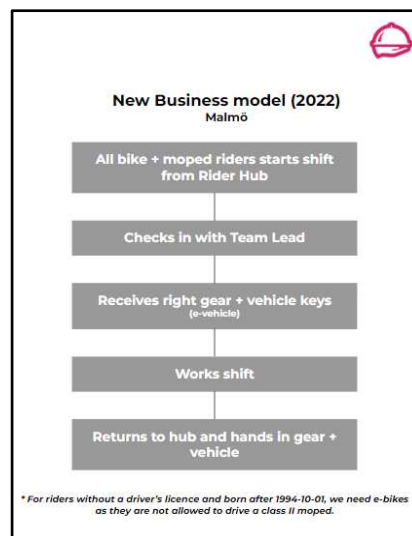
Finally the last section of this chapter will apply all the fixed cost and variable costs calculated in the previous sections to the different scenarios. The best possible outcome, break even outcome and worst possible outcome are presented for each scenario. From this feasibility study it will be possible to determine which scenario

is most likely to succeed and should be implemented.

4.1 Rider survey

The first section of this chapter of the analysis will define the riders' attitude towards this project. As it has been previously stated there are several questions that need to be answered in order to have a clear overview of where the rider's position stands on this topic. The survey seeks to determine the likeliness of riders being willing to shift to the new business model or if this would have too much of an impact on their flexibility on the job. The following survey will also give an overview on whether the riders are in possession of a driver's licence and what type of licence it is. The final question of the survey is if the riders are willing to work on a sustainable e-vehicle provided by foodora. The survey was conducted using typeform which was sent through foodora's communication channels. The survey was sent out to a total of 150 riders in which 44 responded. This is the equivalent of a response rate of 29 percent. Please note that the full survey can be found in **Appendix A**. The riders are first given an introduction of the new business model with a description on how it would operate. The table below displays that view.

Table 1.4.1: The new business model 2022 Malmo



In comparison to foodora's existing business model, riders are asked to start their working shift at the rider hub. This implies an extra step than the current model where riders can start their shift almost from anywhere within the delivery zone of Malmo. Once the rider arrives at the rider hub he is greeted by a team leader, that is

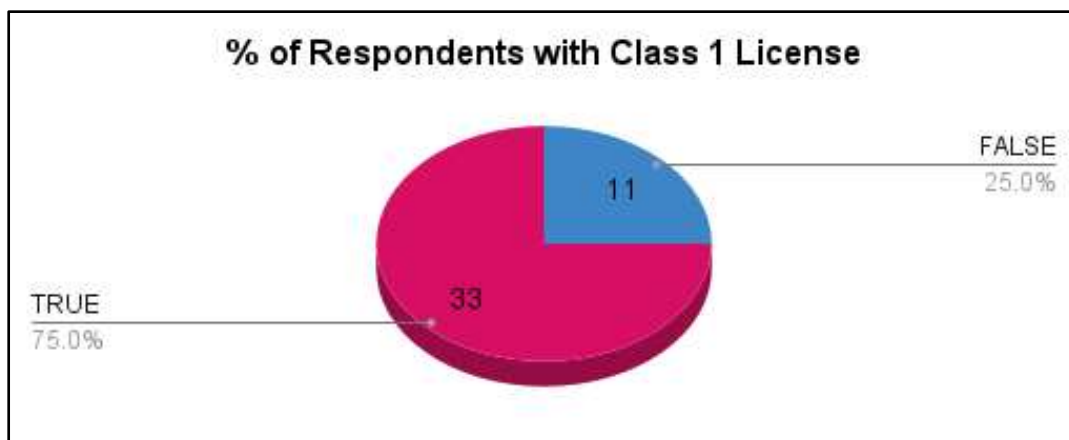
considered office staff, who then hands over the equipment needed to fulfil the work. Riders no longer keep the equipment at home as other online job platforms. As the equipment is now shared amongst riders this will be cost saving on equipment ordering which will be analysed at a later chapter. Riders are then given an e-vehicle and leave to work their shift. Once their shift is over they return to the rider hub and hand over the equipment and the e-vehicle.

Before the survey, the rider is given the full step by step process as shown in the picture above. Once the rider has understood the survey continues with more specific questions that need to be answered in order for this project to be fulfilled.

As the proposed e-vehicle for this project can reach speeds up to 45 km/h it is considered a class 1 moped according to the Swedish Transport Agency (STA) (Transportstyrelsen 2022). This requires all class 1 moped drivers to have a valid drivers licence according to the STA traffic laws. Therefore riders were asked whether they had a valid driving licence. Depending, on their answer, riders with a valid drivers licence were asked whether they were interested in working with a sustainable e-vehicle provided by foodora.

The graph below shows the percentage response for riders having a driver's licence.

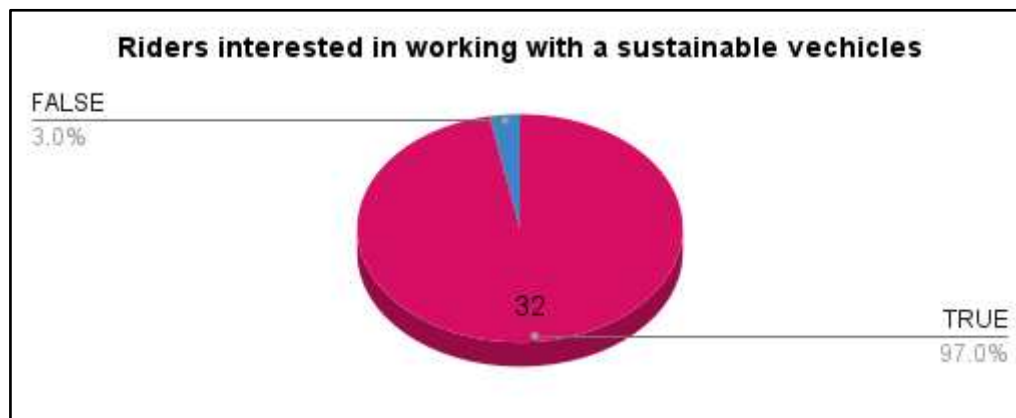
Graph 2.4.1: Percentage of respondents with a class 1 driving licence



Out of the 44 respondents, 33 riders reported that they have a valid driver's licence. This is the equivalent to 75 percent of respondents. Given that result it can be assumed that out of 150 riders working in Malmo that 75 percent of them should have a valid driver's licence, hence 112 riders. This high result means that the larger

scale up of e-vehicles proposed in scenario 2 would be possible. It also shows that for scenario 1 there is no risk related to launching as there would be no issues in riders not having a driver's licence for the e-vehicles. The next question asked in the survey is only asked to the respondents that have a valid driver's licence, hence 33 of the 44 riders that participated in the survey. The next question analyses e-vehicles. Would the rider be interested in working on a sustainable e-vehicle hence participating in the new business model.

Table 3.4.1: Riders interested in working with a sustainable vehicle



Even more surprisingly 97 percent of them answered that they would be willing to work with a sustainable e-vehicle. This shows that riders are willing to try out a new business model that would give them less flexibility but a higher income which contradicts a previous study made by survey Berger (2019) that emphasised more on the importance of flexibility than the monetary value for online job platforms.

The outcome of this survey can be seen as a positive step in the feasibility of this project. Almost all riders with a driver's licence are willing to work on a sustainable vehicle and contribute to testing this new business model.

4.2 The Transport Workers Union

The next step after the positive results received in the survey, where riders expressed interest in working on a new business model, was to reach out to the TWU. Foodora and the Transport Worker Union signed a collective bargaining agreement in early 2021. The agreement covers all bicycle and moped riders who make

deliveries with foodora regardless of the rider being a union member. As this project proposes a change in the working routine of the rider, their approval to move forward is a requirement. More specifically the approval of the regional safety representatives (RSO) and of the Transport Worker Union representative (TWUR) are needed.

*The risk assessment was held on the 17th of September 2022. Please note that the full risk assessment can be found in **Appendix B**.*

Table 1.4.2: The project's risk assessment

Risk description	Risk assessment			Solution	Responsible	Done, date?	Follow-up done, date.
	Low	Medium	High				
Protective equipment is needed to drive the moped	x			Foodora provides protective equipment according to the Agreement.	Andrew, RM + AM in Malmö.	Already completed	Ongoing
Unsecured load		x		The load must be secured and approved by the Swedish Transport Agency	Fredrique (carried out in connection with the introduction into stockholm)	Already completed	Ongoing 

The general outcome of the assessment was positive from the RSO and TWUR with few key takeaways. Out of the several criterias concluding remarks from the Risk assessment two are highlighted here as they will have an impact on the fixed cost. The first one as highlighted in table 1.4, being safety and protection for the riders. In Sweden the maximum speed for a moped to drive is 45 km/h. This is the speed in which the proposed e-vehicles can reach. As the e-vehicle are going to be operating at speeds up to 45 km/h, some sort of protection against debris and wind is required.

The next key point is the weight capacity that the riders are expected to handle. Currently all riders that fall under the CBA, have a max weight capacity of 8 kilograms. The reason behind this is that the rider carries the order on their back and therefore anything heavier could lead to injuries. As the proposed new operating model is going to allow riders to operate at much higher speed it is a requirement that the rider bags are safely mounted onto the e- vehicle and not on their backs. This will require the e-vehicle to be fitted with a rack and basket either in the front or in the back of it. This will allow the rider to carry more weight and carry it in a much safer manner.

On a side note, this is a positive addition to the e-vehicle as it allows for the courier to carry heavier orders. This in turn, results in a lower CPO as less riders are

needed to deliver the same amount of orders, however this is not something that is considered or discussed in this research.

On another note, if scenario 1 would be selected, which would not include all riders in the city Malmo, a random selection process would be needed to select which riders ought to participate in the new business model. In scenario 2 all riders would be offered the possibility to work on an e-vehicle and therefore the selection process would not be required. However, this does not impact the fixed cost for the e-vehicle.

If the above mentioned requirements are met, the TWU signs off on the project. This is yet another step forward in the feasibility of this project's success. Both scenarios have the potential to succeed with the results from above.

4.3 CAKEs fixed cost analysis

In the following paragraph the e-vehicles intended to be used for the project are introduced. This is then followed by an in depth overview of all calculations related to the costs of leasing the e-vehicles. This is one of the fixed costs mentioned at an earlier stage in the methodology. For both scenario 1 and 2 the fixed costs will remain the same but will only vary in terms of the amount of e-vehicles needed for each respective scenario. There are several variables to consider for the following chapter in order to identify the total fixed cost of using CAKE. They are the leasing cost, electricity and charging costs, the additional equipment needed to fulfil the requirements stated from TWU. Once these fixed costs are identified, the total cost for the e-vehicles in each scenario is calculated. CAKE is a Swedish company founded in 2016 which offers a wide range of electric motorcycles. The main goal of the company is to combine excitement with responsibility, while inspiring its consumers to shift to a zero-emission vehicle. This is reflected in their mantra “light, quiet and clean” (Cake 2022).

CAKE is selected as the e-vehicle for this project as its e-vehicle provides zero- emission which according to the existing literature is crucial for many consumers. (Gupta, 2022). All values for calculating the fixed cost of CAKE’s e-vehicles in the upcoming equations are found in this chapter and are calculated in the local currency, the Swedish Kronor (SEK).

Please note that CAKE’s prices and other related costs can be found in the **Appendix C**.

4.3.1 Leasing cost

CAKE offers a wide range of e-vehicle, however the one that is best suited for the project is the CAKE Makka. This statement is based solely on the risk assessment from the TWU and the price for the e-vehicle. The price for leasing one CAKE Makka (CL) is 1810 SEK per month. Taking this into consideration, determining the total cost for leasing per month in both proposed scenarios is needed. For scenario 1 it is proposed to lease 10 CAKEs, while for scenario 2 it was proposed to lease 40, in order to fulfil each project.

$$CL \times \text{Amount of E-vehicles} = \text{Leasing cost} \quad (1.4.3.1)$$

$$\text{Scenario 1: } 1,810 \times 10 = 18,100 \text{ SEK}$$

$$\text{Scenario 2: } 1,810 \times 40 = 72,400 \text{ SEK}$$

As seen in the above equation the total leasing cost per month for scenario 1 and 2 are 18,100 SEK and 71,400 SEK respectively. One thing to note is that this does not include any additional equipment that the risk assessment from the TWU required and therefore the total leasing cost will increase.

4.3.2 Electricity cost

The CAKE Makka (C) e-vehicle is an e-moped which can reach a speed up to 45 km/hour. The power consumption of the battery is 1.5 KWh for 3 hours. The e-vehicle has an approximate maximum range of 54 kilometres. According to the foodora online reports, moped couriers in Malmo cover an average distance of 9 - 11 kilometres per hour and can work up to 8 hours in a day (Delivery Hero, 2022b). This means for a courier working a 9 hour shift he will cover an average rounded value of 90 km. Given the max range capacity of the cakes, the batteries will need to be charged twice a day or it will be required to use two batteries per cake. One single cake takes a total of 3 KWh (K) per day which is the equivalent to charging the battery twice. The average cost of electricity in Malmo in August 2022 was 3.8 SEK per kWh (Elbilstatistik, 2022). This value will be used for the fixed cost for electricity. Although it is difficult to argue that electricity cost is fixed as it can fluctuate for this project it is considered as fixed cost to roughly estimate the cost of charging the e-

vehicles. Given the electricity price

(E) considered for this project is 3.8 SEK it is now possible to determine the cost of charging the vehicles per day.

Battery consumption in kWh / battery life in hour = battery kWh per hour (1.4.3.2)

$$1.5 / 3 = 0.5 \text{ kWh per hour}$$

Battery kWh per hour x working hours in day = Battery kWh per day (2.4.3.2)

$$0.5 \times 9 = 4.5 \text{ Kwh per day}$$

Electricity price x Battery kWh per day = Electricity price per day (3.4.3.2)

$$3.8 \times 4.5 = 17.1 \text{ SEK}$$

The results for the electricity price is approximately 17.1 SEK for one CAKE per day (ED). As mentioned in the methodology the project is scheduled to run for the entire month therefore the price for one month or 30 days (M) is needed.

ED x M = Electricity price for one C per month (4.4.3.2)

$$17.1 \times 30 = 513 \text{ SEK}$$

The electricity cost for one e-vehicle for the entire month would cost a total of 513 SEK per CAKE (EM). In the previous chapter both scenarios were briefly introduced where the first proposed an operation with 10 CAKEs while the second and third proposed operating with 40 CAKEs. For that reason knowing the total cost of electricity for all scenarios is needed.

EM x C = Electricity price for C per Month (5.4.3.2)

$$\textbf{Scenario 1: } 513 \times 10 = 5\,130 \text{ SEK}$$

$$\textbf{Scenario 2: } 513 \times 40 = 20\,520 \text{ SEK}$$

The total monthly cost of electricity for the CAKEs in scenario 1 and 2 are 5130 SEK and 20520 SEK respectively. Now that the cost for charging the e-vehicles has been determined, the next step is to calculate all the additional equipment costs.

4.3.3 Additional equipment cost

As it was highlighted in a previous chapter the Transport Workers Union also had some requirements that needed to be met. The first one being debris or wind protection. This is something that cAKE has the possibility to mount on their CAKE Makka e-vehicles. Their in- house option is a windshield (WS) which has a leasing price of 100 SEK per unit. This will meet the safety requirements highlighted by the TWU.

The next requirement was a mounted basket on the rear in order to safely transport the goods. There is additional equipment that CAKE can offer, these are a rear carrier and rear basket which are mounted in the back of the e-vehicle. According to CAKE, the cost for leasing a rear carrier (RC) at the time of this project is 120 SEK and for the rear basket (RB) 145 SEK. These add-ons above will check off the requirements from the TWU.

Moreover, as mentioned above the maximum range of the selected e-vehicle is 54 kilometres, therefore in order to utilise the e-vehicle throughout the day an extra battery would be required as the charging time for one battery takes approximately 3 hours for a full charge Cake offers extra batteries (B) at a cost of 105.4 SEK per unit.

$$\begin{aligned} WS + RC + RB + B &= \text{Total additional equipment price per CAKE} & (1.4.3.3) \\ 100 + 120 + 145 + 105.4 \text{ SEK} &= 470.4 \text{ SEK} \end{aligned}$$

The above equations show the result of the extra equipment (Y) needed for one e- vehicle. The following equations below will define the total costs of the extra equipment for both scenarios.

$$Y \times C = \text{Total price of equipment for given number of CAKEs} \quad (2.4.3.3)$$

$$\text{Scenario 1: } 470.4 \times 10 = 4704 \text{ SEK}$$

$$\text{Scenario 2: } 470.4 \times 40 = 18\,816 \text{ SEK}$$

The total cost of the extra equipment for scenario 1 is 4704 SEK while for scenario 2 it is 18816 SEK. Now that all the individual costs have been calculated in the next chapter section below, these costs will be added to one another in each

scenarios to give the overall total fixed cost of using the e-vehicles

4.3.4 Final fixed cost of e-vehicles

This following chapter establishes the total fixed cost on the e-vehicle. This fixed cost variable is the total cost for all leased e-vehicles in both scenarios.

$$\text{Total Leasing} + \text{Total Electricity} + \text{Total Additional Equipment} = \text{Total price for CAKEs (4.7)}$$

$$\text{Scenario 1: } 18,100 + 5,130 + 4,704 = 27,934 \text{ SEK}$$

$$\text{Scenario 2: } 72,400 + 20,520 + 18,816 = 111,736 \text{ SEK}$$

This chapter sought to identify the total fixed costs for the e-vehicles for both scenarios. The values are now identified. Scenario 1 which has a total of 10 e-vehicles will see a total fixed cost of 27,934 SEK per month while scenario 2 which has a total of 40 e- vehicles will see a total of 110,736 SEK.

The next chapter will introduce the administrative costs associated with this project.

4.4 Administration cost

The new business model proposed to realise the project in both scenarios will see the administration cost increase. The administration cost is defined as the extra people power needed to handle the extra workload that the project brings. The reasoning behind this is that it will require having more personnel working at the rider hub, in order to hand out equipment and the e-vehicles to the incoming riders. As it was presented before, the operating hours intended for this project is about 12 hours as the vehicles will be out between the hours of 10:00 until 22:00. This would mean that riders will be working between those hours, hence office personnel are needed for those given hours. The current rider hub is open between 8:00 and 18:00. This would mean that the extra people needed are only going to be after 18:00 and until 22:00. This accounts for four hours extra needed per day. The same amount of personnel and hours are considered for both scenarios, as only one person is needed to greet, hand out equipment and the e-vehicle to the arriving riders.

$$\begin{aligned} \text{Hours per day} \times \text{month in days} &= \text{Total hours per month} & (1.4.4) \\ 4 \times 30 &= 120 \text{ hours} \end{aligned}$$

The above equation showcases that the estimated extra required hours per month needed to fulfil this project is 120. The next step is to calculate what that would cost foodora to pay for this administration costs. Foodora's extra part time work is known as "office hours" and is used to pay out to blue collar employees that do additional tasks for the company (Delivery Hero, 2022b). The pay is equivalent to 140 SEK per hour. With this in mind, it is now possible to determine the administration cost based on the total hours per month identified above.

$$\begin{aligned} \text{Hours per month} \times \text{office hours pay} &= \text{administration cost} & (2.4.4) \\ 120 \times 140 &= 16,800 \text{ SEK} \end{aligned}$$

This would mean that the total monthly fixed cost for administration is 16 800 SEK for both scenarios. There are some limitations to the above fixed cost. As there is no previous empirical data on a similar project, knowing the exact amounts for the administration costs is difficult to anticipate. Therefore, these are best estimates based on the current available information and data. There is a possibility that these hours might increase or decrease depending on how the project develops.

4.5 Parking cost

This section will estimate the fixed costs of the additional parking needed to accommodate scenario two. As it was mentioned at an earlier stage there is currently the possibility to park ten e-vehicles at the rider hub so acquiring parking spaces for scenario one is not needed. This would mean that an additional thirty parking spaces are required to be outsourced in order for scenario two to be fulfilled. The average cost of leasing parking for a motorcycle in the city of Malmo is approximately 334 SEK per month (Malmo Stad, 2022). With the following information it is possible to estimate the total cost per month for the thirty e-vehicle parking spaces needed.

$$\begin{aligned} \text{Number of e-vehicles} \times \text{average parking cost} &= \text{Total monthly parking cost} & (1.4.5) \\ 30 \times 334 &= 10,020 \text{ SEK} \end{aligned}$$

The total estimated fixed cost for parking is 10,020 SEK which is rounded down for this estimation to 10,000 SEK.

4.6 Cost savings

There has been extensive amounts of literature on topics related to sustainability and waste as shown in the literature review. last-mile delivery companies tend to spend a lot of resources on equipment for their couriers. In 2021, Foodora alone spent a total amount of 505 742 SEK for riders in Malmo (Delivery Hero, 2022c). The new proposed business model will have riders come and pick up all the equipment needed to fulfil their work at the rider hub. This consists of a Foodora jacket and a thermobag. These items are then returned to the office after their working shift is completed to be washed and reused by another rider. This will see a significant decrease in the purchase of equipment for Foodora.

It is unlikely to see a direct impact upon implementing the project, on equipment cost reduction as this is something that would gradually increase over time. Therefore a rough estimate on monthly savings can be made for both scenarios based on the total spent in 2021. Assuming a median value between both scenarios, which in this case would be 33 percent. With this value in mind it is possible to roughly estimate the monthly saving on equipment.

$$33\% (\text{Yearly spending } 2021 / 12) = \text{Monthly equipment savings} \quad (1.4.6)$$

$$33\% (505\,742 / 12) = 13,909 \text{ SEK}$$

The calculation above indicates an average saving of 13,909 SEK which will be used in both scenarios.

4.7 CPO calculations

In the above chapters, the fixed costs of the e-vehicles, administration, parking and the cost savings related to equipment were introduced and established. This was done for both scenario one and two. These costs, at a later stage in this analysis will be added to the final results of the CPO that the e-vehicles are forecasted to achieve through an improved UTR. The next step of this analysis is to calculate the estimated forecasted CPO based on the increased efficiency the e-vehicles are expected to achieve.

There are several steps required in calculating the expected CPO for riders that are going to use the e-vehicles. The first step will consist of collecting the existing data of riders' average UTR and CPO in Malmo for a given period. With the given results the assumption is that some sort of correlation can be identified and from there it will be possible to predict the CPO for a given UTR. Once the UTR assumptions and forecasted CPO have been established it will be possible to calculate the Total monthly cost of delivering the orders with the e- vehicles. This will be showcased for both scenarios and with the assumptions that the e- vehicles are operating at full capacity. Once these have been determined, it will then be compared to the current CPO of riders in Malmo to the same amount of orders. This will give the net difference between the two. The net difference is the cost difference of delivering the same amount of orders but with different UTR & CPO. The fixed costs are then subtracted from the net difference which results in the expected savings foodora made.

The final step of this chapter is to determine the different outcomes of the scenarios. This is showcased in three ways, which are directly impacted by the efficiency of the riders, in this case through the UTR. The first outcome seeks the best possible outcome, which sees a positive return on the investment. The second outcome is presented as a breakeven case, which displays a scenario where no profit or losses are made. The third outcome or in other words, the worst case scenario, displays where there is no UTR improvement and therefore there are significant losses made.

4.7.1 UTR assumptions and CPO forecast

This chapter will look at forecasting the CPO based on the UTR changes. This

is an essential step in the process of the feasibility of these scenarios as it will help identify what the expected CPO based on a given UTR. The first part of this section will look at existing UTR and CPO data and see how they compare to one another. The next step will seek to identify any correlations between the two and make assumptions on how it is possible to forecast. The table below shows the current average UTR and CPO of riders between week 28 and 38.

Table 1.4.7.1: Average UTR and CPO week 28 to 38

UTR (X)	CPO (Y)
2.63	78.94
3.06	71.90
3.17	70.56
3.25	69.02
3.35	67.89

(Delivery Hero 2022a)

The highest UTR, according to the table above, during the given period is 3.35 which is far less than what the 3PL is achieving using provided vehicles as they achieve on average 3.5 UTR. Another observation that can be made is that as the UTR increases the CPO decreases.

The next step is to predict the CPO for a target UTR and this will be done using the slope and intercept functions. The slope function is a linear regression line through data points in known_y's (CPO) and known_x's (UTR). In this case, CPO is the Y and the UTR is the X value and the data points are identified in **table 1.4.7.1**. This equation will help calculate the point at which a line will intersect the y-axis by using existing x-values and y-values. On the other hand, the intercept point is based on a best-fit regression line plotted through the known x-values and known y-values. The slope and intercept values will help identify the forecasted CPO based on any given UTR.

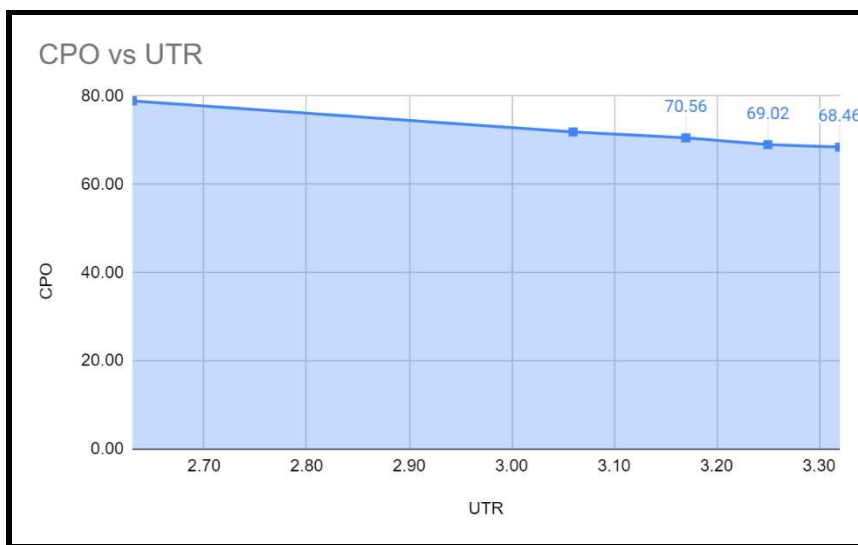
$(\text{known_CPO_values}, \text{known_UTR_values}) = \text{Slope}$ (1.4.7.1)

$Y \text{ values in table}, X \text{ values in table} = -15.47181488$

$(\text{known_CPO_values}, \text{known_UTR_values}) = \text{Intercepts}$ (2.4.7.1)

$Y \text{ values in table}, X \text{ values in table} = 119.5220207$

Graph 2.4.7.1: CPO vs UTR



As anticipated, **table 2.4.7.1** appears to be linear. As UTR increases on the X-axis the CPO decreases on the Y-axis. This means that the more orders riders do within an hour (UTR), the lower the cost per order gets (CPO). However, there are some limitations to this assumption. They are seen by the amount of orders a rider can feasibly do within an hour. For example, it is impossible for a rider to have a UTR of 60 which would mean that the same rider delivers an order every minute. It is simply not possible given all the steps required for a delivery to be completed. With this being considered the highest ever recorded UTR registered from the 3PL partner was 3.65 and therefore this UTR value will be considered as the highest possible UTR value for this research (Delivery Hero, 2022a).

With the above in mind, it is possible to forecast the expected CPO given the UTR changes using the linear equation $Y=mX+C$. With the Slope and intercept values identified in equations 1.4.7.1 and 2.4.7.1 and using the benchmark of 3.5 UTR it will be possible to identify the forecasted CPO for any given UTR value.

$$CPO = (Slope \times UTR) + Intercept \quad (2.4.7.1)$$

$$65.37 = (-15.47181488 \times 3.5) + 119.5220207$$

In other words, the calculation above shows that with a UTR of 3.5 the forecasted CPO is 65.37 SEK. With this calculation we can determine the CPO for multiple UTR assumptions using the same linear equations, as seen in **table 3.4.7.1** below.

Table 3.4.7.1: UTR assumptions vs Forecasted CPO

UTR assumptions	Forecasted CPO
3.4	66.92
3.45	66.14
3.5	65.37
3.55	64.60
3.6	63.82
3.65	63.05

4.7.2 E-vehicles vs current riders CPO (Net difference)

Now that the UTR assumptions and forecasted CPO are determined, the next step is to see what is the highest capacity of working hours that a CAKE Makka can operate per day. This is based on the battery life and the operating hours in Malmo. The battery life has a capacity of 3 hours which was determined in an earlier chapter and for this project it is considered using 2 batteries per e-vehicle. The operating hours in Malmo considered for this project are between 10:00 and 22:00. It is then possible to operate at a maximum capacity of 9 hours per day considering changing time of the battery.

Hours a day per cake x 1 month in days x Number of CAKEs = Total hours a month

(1.4.7.2)

Scenario 1: $9 \times 30 \times 10 = 2700 \text{ hours}$

Scenario 2: $9 \times 30 \times 40 = 10800 \text{ hours}$

With the amount of hours determined for both scenarios it is now possible to determine the number of orders that can be delivered with any given UTR assumption.

Total hours per month x UTR assumption = Total number of orders delivered (2.4.7.2)

Scenario 1: $2700 \times 3.5 = 9450 \text{ orders}$

Scenario 2: $10800 \times 3.5 = 37800 \text{ orders}$

The calculations above showcase the anticipated order numbers the CAKE can deliver with a UTR of 3.5. Looking back at **table 3.4.7.1** for a UTR of 3.5 the forecasted CPO is 65.37 SEK, hence the total cost to deliver these orders can be determined by multiplying the respective CPO with the total number of orders delivered.

CPO x Total orders = Total CPO (2.4.7.2)

Scenario 1: $65.37 \times 9450 = 617\,747 \text{ SEK}$

Scenario 2: $65.37 \times 37800 = 2\,470\,986 \text{ SEK}$

Now that the estimated total CPO for the month has been determined for the e-vehicles in both scenarios the next step is to calculate the net operating difference between this and the current riders CPO. In other words, this translates to what is the difference in CPO for delivering the same total amount of orders for our current riders. As mentioned at an earlier stage, the current riders average UTR is 3.19 which in turn is a CPO of 68.71 SEK.

Current Rider CPO x Total orders = Current riders Total CPO

(3.4.7.2)

Scenario 1: $68.71 \times 9,450 = 649,310 \text{ SEK}$

Scenario 2: $68.71 \times 37,800 = 2,597,238 \text{ SEK}$

With the given total CPO cost in both scenarios it is now possible to determine the net operating difference between the current rider total CPO and the expected outcome for both scenarios. This will show the difference in cost for delivering the same amount of orders. The key difference is the efficiency of the riders which is reflected in the UTR.

$$\text{Current Rider CPO} - \text{Forecasted CPO of e-vehicles} = \text{Net difference (4.4.7.2)}$$

$$\text{Scenario 1: } 649,310 - 617,747 = 31,563 \text{ SEK}$$

$$\text{Scenario 2: } 2,597,238 - 2,470,986 = 126,252 \text{ SEK}$$

The above calculations show that the expected net difference in savings for scenario one which is using ten e-vehicles to be 31,563 SEK per month. On the other hand, for scenario two, which would see all riders use the e-vehicles, a net difference of 126,252 SEK is expected in savings from the current CPO. However, it is important to note that the fixed costs have not yet been deducted from this value which will see the difference be much lower. This will be calculated in the next chapter.

The table below summarises this chapter with an overview of the CPO costs of both scenarios including the net difference between current CPO of the riders who have an average UTR of 3.19.

Table 1.4.7.2: The Net difference overview

	Total hours per Month	UTR assumption	Forecasted CPO	Total estimated orders delivered per month	Total estimate d CPO	Current Riders Total CPO	Net Difference
Scenario 1	2 700	3.5	65.37	9 450	617 747	649 310	31 563
Scenario 2	10 800	3.5	65.37	37 800	2 470 986	2 597 238	126 252

In this chapter the current rider CPO was compared with the expected forecasted CPO of e-vehicles in both scenarios. The conclusion using the benchmark of 3.5 UTR that the e- vehicles are expected to perform to is that there is a net

difference between the total CPO. This is overall a positive outcome for the feasibility of the project. In the next chapter the new discovered total CPO will be implemented with the fixed costs and calculated. The scenarios are then presented in a best, break even, worst case outcome, where the feasibility study will conclude.

4.8 Possible Outcomes of the feasibility study

The goal of this section is to firstly find the break even outcome of both scenarios. The break-even case is where the UTR improvements of the e-vehicles reach a point where foodora's total CPO makes no profit or significant losses from the investments made in this project. One of the hypotheses is that by using the 3.5 UTR benchmark the investment should break even. This is calculated using the net difference values identified in the previous chapter and subtracting the fixed costs, which will give the savings. This will give the overview needed to see if these projects are feasible to realise.

The next step is to identify the best possible outcome. This is done by finding the UTR value in which the net balance sees a positive return from the CPO after the monthly expenses for the fixed costs are added. Finally the worst possible outcome is presented, where the riders using the e-vehicles see no UTR improvement and therefore there are significant losses made. The above mentioned steps of this chapter will be done simultaneously for both scenarios and later presented in tables to be evaluated. The scenario with the highest feasibility to succeed will be selected for implementation.

The first calculation to be made is on the bench mark of 3.5 UTR and to see whether there is any profit made or losses made. A reminder on the findings of the fixed costs

(1.4.8)

$$\begin{aligned} \text{Net difference} &= \text{Cost of CAKE} - \text{administration cost} - \text{parking} + \text{equipment savings} \\ &= \text{Savings} \end{aligned}$$

$$\text{Scenario 1: } 31,563 - 27,934 - 16,800 - 0 + 13,909 = 738 \text{ SEK}$$

$$\text{Scenario 2: } 126,252 - 111,736 - 16,800 - 10,000 + 13,909 = 1,625 \text{ SEK}$$

As it was hypothesised if our riders would achieve an average UTR of 3.5 the

cost would even out in both scenarios. The savings are close to zero in scenario one and two, with 738 SEK and 1,627 SEK respectively. In this case, with all investments needed for this project if the riders were to achieve the expected UTR, foodora would not see any loss or significant profits from this break even outcome. On the other hand, the riders using the e-vehicles would be earning significantly more as they would be delivering more orders per hour. This is a significant step forward in the feasibility of the project as it shows in theory that for this case it is possible for foodora to provide e-vehicles to the riders without any losses and for riders to earn significantly more.

The next interesting question is to identify the best possible outcome where significant profits are seen from this project. There are several limitations to acknowledge. As it was previously mentioned there are limitations to consider to the UTR that can be achieved by the riders. Realistically it would be highly unlikely for a rider to achieve anything above 3.65 UTR. For this reason, that value has been selected in finding the best possible outcome.

The best possible outcome has been argued to be with the following identified UTR of 3.65. Following the exact same steps from the previous chapter, the net difference and balance will be identified for the new UTR. The following calculations assume the e-vehicles operate exactly the same amount of hours per month as previously mentioned but in this case are much more efficient.

$$\text{Total hours per month} \times \text{UTR assumption} = \text{Total number of orders delivered} \quad (2.4.8)$$

$$\text{Scenario 1: } 2700 \times 3.65 = 9855 \text{ orders}$$

$$\text{Scenario 2: } 10800 \times 3.65 = 39420 \text{ orders}$$

Looking back at **table 3.4.7.1** in the previous chapter we can identify that for a UTR assumption of 3.5 the forecasted CPO is 63.05. This value is used to calculate the total CPO for the month for the given amount of orders delivered.

$$\text{Forecasted CPO} \times \text{Total orders} = \text{Total forecasted CPO} \quad (3.4.8)$$

$$\text{Scenario 1: } 63.05 \times 9855 = 621\,358 \text{ SEK}$$

$$\text{Scenario 2: } 63.05 \times 39420 = 2\,485\,431 \text{ SEK}$$

The next step in order to determine the possible savings is to calculate the current rider CPO with the total orders given from this UTR assumption. Once the total current rider CPO is calculated the forecasted total CPO will be subtracted in order to give the net difference.

$$\text{Current Rider CPO} \times \text{Total orders} = \text{Current riders Total CPO} \quad (4.4.8)$$

$$\text{Scenario 1: } 68.71 \times 9855 = 677\,137 \text{ SEK}$$

$$\text{Scenario 2: } 68.71 \times 39420 = 2\,708\,548 \text{ SEK}$$

$$\text{Current Rider total CPO} - \text{Forecasted total CPO of e-vehicles} = \text{Net difference} \quad (5.4.8)$$

$$\text{Scenario 1: } 677\,137 - 621\,358 = 55\,779 \text{ SEK}$$

$$\text{Scenario 2: } 2\,708\,548 - 2\,470\,986 = 237\,562 \text{ SEK}$$

The net difference for both scenarios now calculated makes it now possible to determine the expected savings from achieving a UTR of 3.65. Taking the net difference and subtracting the fixed cost variables will result in the total savings for both scenarios.

$$(6.4.8)$$

$$\text{Net difference} - \text{Cost of CAKE} - \text{administration cost} - \text{parking} + \text{equipment savings} = \text{Savings}$$

$$\text{Scenario 1: } 55\,779 - 27934 - 16800 - 0 + 13909 = 24\,954 \text{ SEK}$$

$$\text{Scenario 2: } 237\,562 - 111\,736 - 16800 - 10000 + 13909 = 112\,935 \text{ SEK}$$

Were the riders achieve a UTR of 3.65 the calculations show that Foodora could expect a return of investment of 24,954 SEK and 112,935 SEK for both scenario one and two respectively. This is identified as the best possible outcome.

The worst possible outcome is easily identified. The definition of this outcome is where riders have no improvements whatsoever on their UTR while using the e-vehicles. This in turn means that the CPO will remain the same as the current rider CPO. Therefore the net difference is null. This calculated for the total fixed cost of all expenses will give the total expected losses.

(7.4.8)

Net difference - Cost of Cakes - administration cost - parking + equipment savings = Savings

Scenario 1: $0 - 27934 - 16800 - 0 + 13909 = -30\,825 \text{ SEK}$

Scenario 2: $0 - 111\,736 - 16800 - 10000 + 13909 = -124\,627 \text{ SEK}$

The total expected loss for scenario one is minus 30,825 SEK per month and minus 124,627 SEK per month for scenario two where there will be no improvement in the UTR. Now that all the values for the best case, break even case and worst case have been identified for both scenarios they have been placed in the following tables below for a better overview of the possible outcome of this feasibility study.

Table 1.4.8: The feasible outcomes for both scenarios

40 cakes	Best case	Probable/Break even case	Worst Case	10 cakes	Best case	Probable/Break even case	Worst Case
	(3.65 UTR)	(3.5 UTR)	No UTR improvement 3.19		(3.65 UTR)	(3.5 UTR)	No UTR improvement 3.19
Working hours covered by Cakes (60%)	10 800	10 800	10 800	Working hours covered by Cakes (25%)	2700	2700	2700
Total Orders delivered	39 420	37 800	34 452	Total Orders delivered	9855	9450	8613.0
Expected CPO	63.05	65.4	68.7	Expected CPO	63.05	65.4	68.7
Net difference	237 562	126 252	0	Net difference	55 779	31 563	0
Fixed costs	- 84 936	- 84 936	- 84 936	Fixed costs	- 44 734	- 44 734	- 44 734
Cost savings	13 909	13 909	13 909	Cost savings	13 909	13 909	13 909
Savings	112 935	1625	- 124 627	Savings	24 954	738	-30 825

This analysis, through a feasibility study, has shown that if Foodora were to implement the new business model on both a small scale or a full scale, by providing riders with e-vehicles it is likely not to see any profit or losses to its initial investments if riders were to achieve the UTR benchmark of 3.5. On the other hand, riders should earn much more as their efficiency increases. There is also the possibility that the UTR exceeds expectations in the best case scenario where in this case Foodora would see a profit made on their initial investment.

As both scenarios have now proven to be feasible, it is required to look at other external factors in making the final decision on which scenario to select for implementation. The first thing to consider is that out of the 150 riders that the survey was sent to, only 44 responded. Therefore, implementing this on a larger scale might see many of the e-vehicles stand idle as they are not being used as it would be

unknown if all riders would be interested in participating. A reminder that these calculations above are based on a full utilisation of the e-vehicles, meaning that they operate everyday for 9 hours.

According to the findings, hypothesis 1, where the use of e-vehicle significantly increases the UTR and has no financial impact on Foodora, seems possible. The participation in the survey also shows an interest in this sustainable business model which is in line with hypothesis 2.

The conclusion of this feasibility analysis recommends that scenario one is implemented as it poses the least amount of risks.

5. Project Implementation

The outcome of the feasibility analysis showed that the most feasible scenario to succeed was the first one. In the following chapter this scenario is implemented in reality. The goal of the project is to identify whether the riders, were they to receive an e-vehicle provided by Foodora, could achieve a higher UTR. The target UTR for this project is 3.5, which is the benchmark in comparison to foodora's 3PL performance, but also where the feasibility study indicates that the CPO would break even with the investment on the project. This would result in no profits or losses for the company but a higher income for the riders. On the other hand, it shows that foodora is thriving for sustainable solutions and participating in solving the many issues related to the last-mile delivery sector.

The following chapter will showcase in detail the launch of the project of scenario 1. Going forward as scenario 1 was selected it will be referred to as 'project' rather than scenario

1. Furthermore this chapter does not go through the step by step implementation of the project but rather analyses the outcome of it. The specific steps taken to implement the project can be found throughout the earlier chapters. A brief description of the implementation is given in terms of how long the project.

This chapter is divided into two sections. The first part will look at the average performance of the riders during the project. This section will be viewed through a company perspective. The overall outcome of the project is then compared to the expected results gathered during the feasibility study. The comparison of the two will give a comprehensive understanding on whether foodora's investment was profitable, broke even or saw losses. The results of the projects are then evaluated and explained through data collected throughout the operation. This stage gives valuable insight on what succeeded, but also on what could have been improved. It will also seek to point out everything that did not work. This will allow for future projects from foodora or other companies to consider these while preparing the projects.

The next section will be looking at the outcome from a rider perspective. Using the rider experience survey, the NPS will be a good indicator of whether or not the project was considered successful. There are specific sectors targeted for this section. The first topic seeks to shed light on the new business model. The

sustainability focus of having riders pick up their equipment at the office was a completely new routine for riders, therefore having input on that is crucial. The foodora jacket, delivery bag and e-vehicles are amongst the items given upon arrival at the hub. The next one looks at the overall rider satisfaction in terms of their performance. Did the riders see a higher earnings as the hypothesis entails?

This chapter concludes with an overview of both topics above and makes clear assessment of whether the project is considered successful or not.

The launch of the project was on the 1st of october and operated throughout the month. Pre-launch a total of 10 CAKE Makka e-vehicles were delivered to the rider hub equipped with the windshield, rear back and basket as per TWU requirements. The next requirement from the TWU was to randomly select the riders that participated in the initial survey. A total of 20 out of the 33 that had a driver's licence were selected for the project. Once the riders were selected they were given a step by step walkthrough of the new business model. The riders were then instructed on how to operate the e-vehicles and prepared for their first working shift on the 1st of October. **Appendix D** shows a picture of the first day of the launch.

A reminder on the hypothesis of this project, is that the new proposed business model will see riders achieve a higher UTR, which in turn will reduce the cost per order for foodora.

5.1 UTR performance

In this chapter the performance of riders who participated in the project is reviewed. The performance is analysed and the results are thoroughly explained. The results are then compared to the feasibility analysis for scenario 1 in order to see whether foodora made a profit, broke even, or a loss on its investment. In the following table 1.51 the end of the month results of the total orders delivered, total hours worked and average UTR for the e-vehicles is introduced. **Table 2.5.1** is the scenario 1 expected outcome for comparison.

Table 1.5.1 Project Average performance

Total orders	Total hours	Average UTR
6 548	1 952	3.35

(Delivery Hero, 2022b)

Table 2.5.1 Scenario 1 expected outcome

Total orders	Total hours	Average UTR
9 450	2 700	3.5

Table 3.5.1 Regular riders average performance October

Total orders	Total hours	Average UTR
25 049	7 828	3.2

(Delivery Hero, 2022b)

The general outcome at first glance is concerning. None of the targets predicted from the feasibility study were achieved. The total amount of orders delivered in October by the e- vehicles was significantly lower than what was expected. Only 6,548 orders were delivered which is 2,902 orders fewer than anticipated. The total working hours is also much lower than what was expected. A total of 748 working hours were missed in order to achieve the target of 2,700 hours for scenario 1.

Although the UTR did increase from what the current rider average is (3.19), it still did not meet the expectations of 3.5. The average UTR achieved for the month is 3.35 which according to **table 1.4.7.1** is a CPO of 67.89. As 3.5 UTR was shown to be the break even case where foodora saw no profits or loss, it can already be anticipated that losses are made in this first month. The total loss is calculated below. For the detailed step by step explanation of these equations refer to chapter 4.7.2.

$$\text{Achieved CPO} \times \text{Total orders} = \text{Total CPO} \quad (1.5.1)$$

$$\text{Project: } 67.89 \times 6,548 = 444,543 \text{ SEK}$$

$$\text{Current Rider CPO} \times \text{Total orders} = \text{Current riders Total CPO} \quad (2.5.1)$$

$$\text{Project: } 68.71 \times 6,548 = 449,913 \text{ SEK}$$

Current Rider total CPO - Total CPO = Net difference (3.5.1)

Project: $449,913 - 444,543 = 5,370 \text{ SEK}$

(4.5.1)

*Net difference - Cost of Cakes - administration cost - parking + equipment savings =
Savings*

Project: $5,370 - 27,934 - 16,800 - 0 + 13,909 = - 25,455 \text{ SEK}$

As it was anticipated the loss for the project during the month is - 25,455 SEK. Although this loss is not the worst possible outcome that was presented in the feasibility study it still presents a significant loss. Understanding the reasoning behind this outcome is crucial if any improvements are to be made. Throughout the month while the project was on-going several outliers were identified that impacted the overall outcome.

One of the core issues that arose during the project was the batteries of the e-vehicles. On average riders were returning to the office after only working between 2 to 2.5 hours. According to CAKE, the battery life should have lasted up to 3 hours which was not the case. In a perfect closed environment the battery is most likely to achieve the performance promised by CAKE, however in reality when external factors came into play the battery performed extremely poorly. This made it almost impossible to reach the 9 hours a day and even less the 2,700 monthly hours that the feasibility study had accounted for. This is the reason why the order volumes were significantly impacted.

Another impact that was noted was the involvement of the TWU. As every procedure and changes needed to be fully transparent and communicated with them it made it extremely difficult to assign good hours to the riders. Not having the flexibility to schedule riders at peak order times severely impacted the average performance of the riders. Furthermore, due to the low participation in the initial rider survey the random selection included only a few handful of riders which were not necessarily the most suited for the project. Several of the selected riders had limited availability due to being in school or having a second job. This would have been different with a wider range of participants for the selection process. Another note would have been, to be able to select the riders based on availability. This would have

been optimal for this project, however having the requirement to randomly select the riders severely hindered the ability of the project to be fully implemented as planned.

Moreover, another issue that was recorded was in relation to the new business model that was introduced. The new business model required the riders to start their working shift at the rider hub in order to start to pick up their equipment and e-vehicle. However, on multiple occasions the riders arrived late to the rider hub. The main reasons were due to traffic and finding parking. This resulted in a snowball effect causing the next rider to be unable to start their working shifts on time as the previous rider had not returned from his shift with the e- vehicle.

Additionally, a secondary impact is identified. These are classified as non controllable as it is not something that can be tackled directly. This impact is the weather. On several occasions throughout the month October the city of Malmo experienced heavy showers and colder winds. These are of course non ideal situations to be working in and this is reflected in the performance of the riders on those specific days. The average UTR is 0.10 lower and the working hours are approximately 30 minutes less than the monthly average (Delivery Hero, 2022a). This had a significant impact on the overall outcome of the project.

The general results from a company perspective is that the project was not successful as it did not reach the targets that the feasibility study anticipated. The outliers behind the poor results were introduced and explained. The next step is to analyse the outcome of the project from a rider perspective.

5.2 The Project NPS

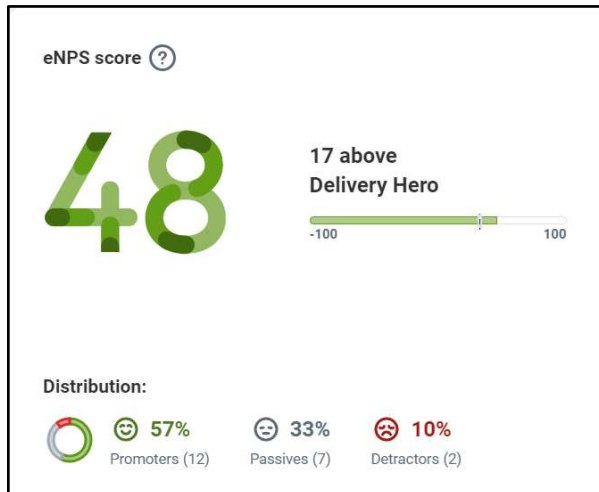
The following chapter will deep dive into the rider's perspective in the project. This section is divided into 2 sections. The first section will look into the rider experience survey which is measured through an NPS. The same rider experience survey is sent to all riders in Malmo, however by selecting the riders that participated in the project it will be possible to compare their overall NPS to that of the regular riders. From this perspective, it will give a good overview on the general appreciation of the new business model.

The next section will compare the project riders earnings to that of the regular riders. This will indicate whether the riders benefited from using the e-vehicle.

The DX survey was sent once the initial month of the project ended. The

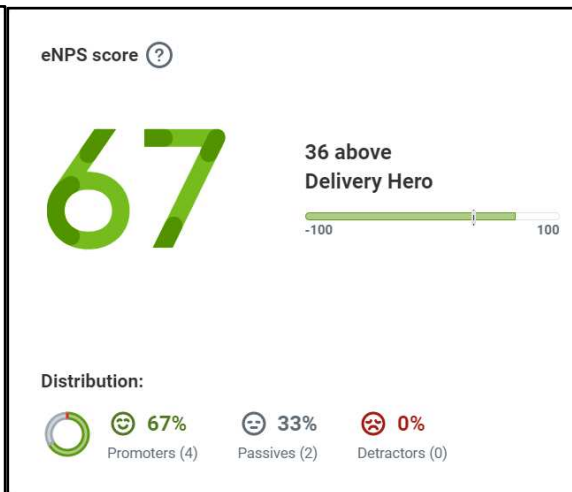
results of the outcome are presented in the tables below. Out of the 150 riders it was sent to, 67 responded. From the project riders 17 out of 20 riders participated in the survey.

Table 1.5.2: Rider NPS Malmo



(Peakon, 2022a)

Table 2.5.2: Project Rider NPS



(Peakon, 2022b)

The overall outcome is significantly surprising. While the general rider experience is generally excellent as seen in **table 1.5.2**, the project riders scored 19 points over the NPS of regular riders. This means that the project riders are much more satisfied with their work than the regular riders. There are four main promoters and two passive that were highlighted in the project's NPS. They are as follows: Work environment, reward, support and strategy. The passive are flexibility and work load. In regards to the work environment being a promoter, the general outcome from riders was that they felt more part of the company. Having the riders come to the rider hub to pick their equipment created a community amongst them. That feeling of belonging is not something felt amongst regular riders as it is an individual type of work. The reward was the next very high promoter. Project riders saw their UTR increase which in turn should result in a higher income. The promoter for support was described as the support received from managers. This promoter is somewhat intertwined with the work environment as being at the rider hub saw the project rider engage much more with managers in place. The last promoter was identified as the strategy. The success of the strategy depends on whether project riders understand and believe in it. The strategy impacts all project riders as it dictates both short-term

and long-term goals. This is significant to see that the implementation of the project is believed and appreciated by the participants.

The flexibility was a passive outlier. There were some inconveniences in having the project riders come to the rider hub before and after their shift. The time to go back and forth to the rider hub is considered extra time that is lost and needs to be planned by the project riders. The next passive outlier was the workload. The feasibility study accounted for the e- vehicles to be utilised to the maximum, 9 hours per day. This led to an increase in the average working hours of the project riders. More riders could have possibly been selected to reduce this workload.

As it was seen in the previous chapter, riders experienced a higher average UTR than the regular riders. For riders using the e-vehicles during the month of October, they achieved a UTR of 3.35 as shown in table 1.5.1, while regular riders achieved 3.2. However this does not necessarily indicate that the riders actually earned more as the amounts of orders they delivered could be less compared to that of regular riders. In order to see if the project riders actually delivered more orders on average per rider, a comparison can be done with some equations. The Malmo fleet consists of 150 riders where 20 of them participated in the project. The below equations show the average monthly working hours per rider and the average orders delivered within the month.

$$\text{Total hours} / \text{Total riders} = \text{Average Total hours per month per rider} \quad (1.5.2)$$

$$\textbf{Project: } 1\,952 / 20 = 98 \text{ hours}$$

$$\textbf{Regular riders: } 7\,828 / 130 = 60 \text{ hours}$$

$$\text{Average total hours per month per rider} \times \text{Average UTR} = \text{Average monthly orders} \quad (2.5.2)$$

$$\textbf{Project: } 98 \times 3.35 = 328 \text{ orders}$$

$$\textbf{Regular riders: } 60 \times 3.2 = 192 \text{ orders}$$

According to the above calculations the regular riders delivered on average 192 orders and worked 60 hours during the month of October. On the other hand,

From a rider perspective the project can be seen as a success. The overall outcome of the DX survey shows an increase in the average NPS. The average earnings of the riders also increased.

From this point of view, it can be stated that from a riders perspective this project is considered a success. The riders appreciated the sustainable business model.

6. Conclusion and limitations

In this final chapter, the concluding remarks and the limitations implicated from the projects are presented. The research questions and hypotheses are also revisited for a final overview. This project sought to determine whether it would be possible to implement a sustainable new business model for foodora riders in Malmo. The case study was conducted over a period of one month, where 20 riders participated in the project. The core of the research has been the rise of sustainability in society, in this case also affecting the food delivery. The research sought to shed light on the feasibility study of sustainable food delivery in Malmo. Whereas, the analysis indicates the potential challenges and possible outcomes, the reality seems to not always be the same.

The main research question was whether it was possible for foodora to invest in e-vehicles for its riders while maintaining a profitable CPO. The hypothesis related to this question was that the UTR of the riders would increase to a point where the company would not see any losses to their initial investment. Although the UTR of the riders during the test period increased, it did not come to the point that was anticipated in the feasibility study.

The feasibility study benchmarked an average UTR of 3.5, which was considered the desired outcome for the investment to break even with the CPO. On the other hand, the overall outcome from the rider NPS was positive. The DX survey showed highly positive results, where the riders in the test case on e-vehicles scored 19 points higher than the regular riders working on their own vehicle. Riders appreciated the new sustainable business model and experienced higher earnings. Therefore, one can argue that the implementation of the new business model is feasible but not yet perfectly ready to be scaled. More development in e-vehicles is needed in order to succeed in the future. Due to time and capital constraints, one limitation is that the project only focused on a very small proportion of riders for a period of one month. More testing needs to be executed and more data needs to be collected in order to make a full assessment of the project. However, this initial project does reflect on the question of a sustainable business model for food delivery. The batteries experienced difficulties in harder Swedish weather conditions in October, which resulted in the e-vehicles not performing according to the forecasted

outcome. A solution could be to test other e-vehicles that are out on the market instead of CAKE. Another limitation to consider is that in order for the e-vehicles to be worth the investment, they need to constantly run in operations. Every hour that they remain idle and not in use they cost the company money. During the feasibility study, full day usage of the e-vehicles was taken into account. In reality this is extremely difficult to achieve full day operations due to several external factors. Such factors can be: traffic, riders being late, mechanical problems etc.

In conclusion, the question of sustainability in food delivery must continue to be included in the ongoing research and debates. E-vehicles as a mode of transportation will not only continue to improve in the upcoming years, it will help potentially create a better work environment for the riders. Initiating and sustaining these topics will encourage more legislation and create better infrastructures for the food-delivery business to move towards more sustainable solutions. Additionally, the hope of this research is to encourage the e-vehicle industry to come up with creative solutions that will help advance the development of e- vehicles that are suitable for the food delivery industry. There is high interest in finding a feasible solution. The efficient, contactless, and environmentally friendly automated delivery has a lot to offer when it comes to the integration of delivery ecosystems into our cities. Therefore, further needs to be done before any large scale investment can be done from foodora's side.

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CONFIDENTIALITY NOTE

The following sources contain confidential data and are released in confidence solely to the course director of the Department of International Management and the official examiners of this report if requested.

Reference List – Internal Documents

Please note by reason of confidentiality reasons internal sources cannot be attached on the enclosed disk.

Delivery Hero, 2022a. [EU] Logistics & Operations/Logistics Service/Monthly View [confidential].

Delivery Hero, 2022b. [EU] Logistics & Operations/Logistics Rider Performance/Rider Report- Table [confidential].

Delivery Hero, 2022c. [EU] Logistics & Operations/Logistics Rider Shopify/Yearly View [confidential].

Peakon, 2022a. Peakon Employee Voice [confidential].

Peakon, 2022b. Peakon Employee Voice [confidential].

Appendices

Appendix A - Rider survey

3

Your Rooster ID, which you find via My Profile in Rooster: Ditt Rooster ID, som du hittar via My Profile i Rooster-appen:

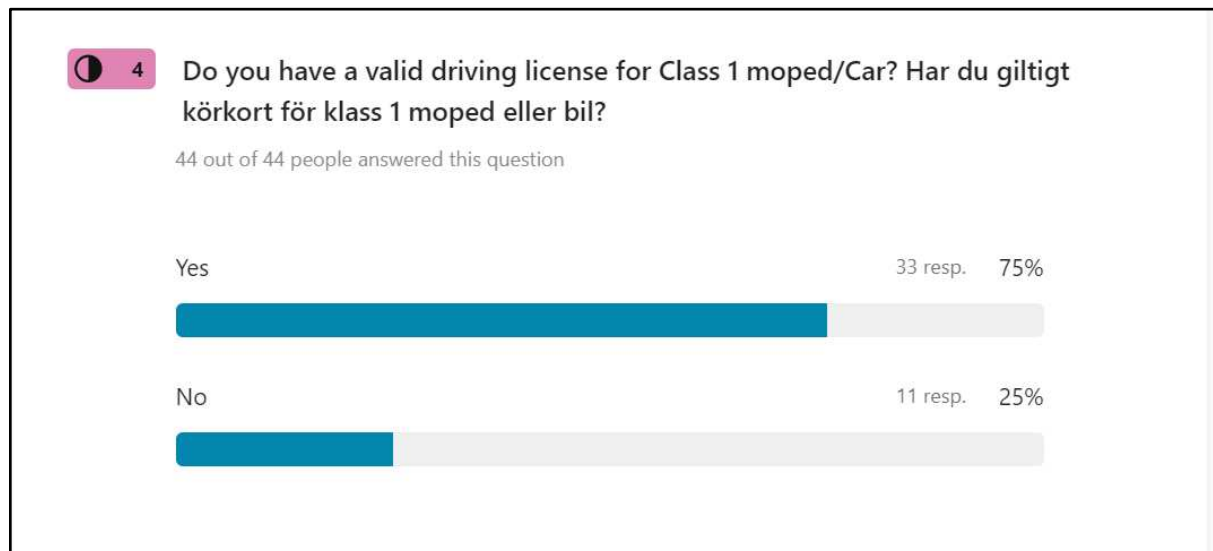
44 out of 44 people answered this question

716320

21 days ago

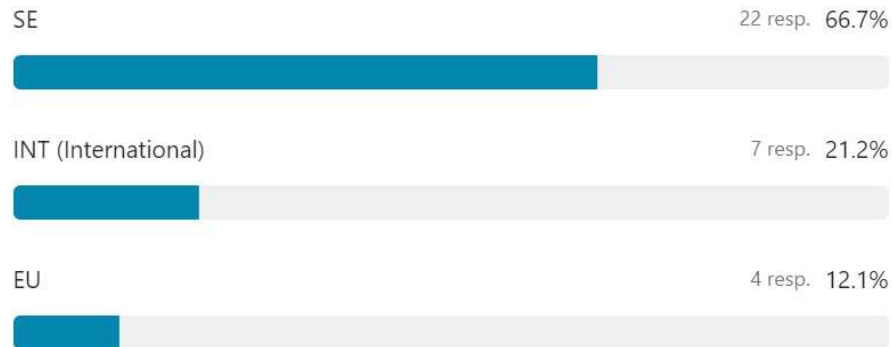
776511

24 days ago



✓ 5 Driving License Type? Typ av körkort?

33 out of 44 people answered this question



🕒 6 Do you want to make a difference by working on a Environment Friendly vehicle?

33 out of 44 people answered this question



Appendix B - The Transport Worker' Union and Foodora's full risk assessment on the project

Bilaga 1. Riskbedömning

	Document Name Riskbedömning avseende förändringar i verksamheten			
Företag Foodora Logistics AB	Datum 2022-09-17		Version	
Planerad förändring Införande av Cake Elmoped	Framtagen av Julia Oldsberg		Godkänd av Anders Palmqvist och Bert Johansson	
Deltagare Ander Palmqvist, Regionalt skyddsombud avd 12 - Malmö Bert Johansson, Regionalt skyddsombud avd 12 - Malmö Nuno Ramos, foodora Andrew Polatos, foodora Julia Oldsberg, foodora				

Riskkälla	Riskbedömning			Åtgärder	Ansvarig	Done, date?	Follow-up done, date.
	låg	medel	hög				
Däck som inte klarar olika väglag	x			All year around däck är på, transport önskar dubbade vinterdäck	Andrew, RM + AM i Malmö	Redan genomfört	Löpande, Se *
Cykeln kanske inte passar alla olika typer av riders	x			Piloten innefattar att bud av olika längd testar mopeden.	Fredrique (utförts i samband med införandet i Sthlm)	Redan genomfört	Löpande, Se *
Skyddsutrustning behövs för att köra mopeden	x			Foodora tillhandahåller skyddsutrustning enligt KA.	Fredrique (utförts i samband med införandet i Sthlm)	Redan genomfört	Löpande, Se *
Ej säker last		x		Lastsäkring godkänd av Transportstyrelsen	Fredrique (utförts i samband med införandet i Sthlm)	Redan genomfört	Löpande, se *
Överhettning av batterier, brand			x	Finns sedvanlig brandsäkerhetsutrustning i den lokala huben, denna genomgås inför användandet startar. Angående batterierna: Makka flex batteriet (som används i elmopederna) har flera skyddskikt, bland annat som innefattar skydd för övertemperatur.	Andrew, RM + AM i Malmö.	Inför användandet	Löpande, Se *

				överspänning etc. upptäcks och batteriet stängs av i syfte att skydda sig själv. Det finns även skydd i form av säkringar som skyddar hela batteriet från kritiska skador. Bolaget tillhandahåller en SoP (standard operating procedure) om hur batterierna ska hanteras på ett brandsäkert sätt.			
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* Fordonen har riskbedömts i Stockholm tillsammans med RSO Kim Råneby, parterna kommer överens att gemensamt följa upp användandet i Malmö efter en testperiod. Parterna ansvarar gemensamt för att kalla till en sådan uppföljning.

Bild på fordon:



Appendix C - FOODORA AB / CAKE agreement

Beskrivning	Antal	Pris/enhet	Kostnad
MAKKA Flex EU GREY	10	35 920,00 kr	359 200,00 kr
Windshield lower Makka	10	1 272,00 kr	12 720,00 kr
Rear carrier	10	3 992,00 kr	39 920,00 kr
Rear basket medium	10	2 632,00 kr	26 320,00 kr
Extra battery	10	13 192,00 kr	131 920,00 kr

Total: 57 008 SEK
All prices ex,vat

5 month rental

11 402 SEK for the entire period per bike. (Invoice 30 days from delivery date)

If deal is not fulfilled after 5 months a fee of 12 500 SEK will be added for each bike.

Leasing with start after 5 months

Monthly payment: 1 810 SEK

First initial payment: 0 SEK

Residual value: 8 551 SEK

Months: 24 (with start after 5 months)

Signature 
8CD4BE12BCBF40D...

Name Hans Skruvfors

Appendix D - First day for riders using the e-vehicles in the new business model

