

Unravelling Online Ojek's User Profile in Jabodetabek

A multi-level identification method

Bachelor thesis by Charline Dielen
of NTHV Breda University of Applied Sciences
in collaboration with ITDP



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Bachelor thesis report

International Traffic Management

NHTV, University of Applied Sciences Breda

Institute for Transportation and Development Policy (ITDP)

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Preface

Dear reader,

This Bachelor thesis is the final milestone in the International Traffic Management curriculum from the NHTV University of Applied Sciences in Breda, the Netherlands. This research was undertaken in Jakarta (Indonesia) at The Institute for Transportation and Development Policy (ITDP), which is a non-profit organization that promotes sustainable and equitable transportation worldwide. On behalf of ITDP, research was conducted on unraveling online ojek's user profile in Jabodetabek, Indonesia. This report is produced within a 17-week timeframe from February 2017 until June 2017.

I would like to use this opportunity to thank all the people involved in this research. Firstly, I would like to thank ITDP for giving me this opportunity. Additionally, I would like to express my gratitude to my two supervisors Lizanne Hessels and Udaya Laksana. Lizanne Hessels assisted me throughout the research process through provision of constructive feedback. Udaya Laksana supported me on a weekly basis with useful sources, information and feedback.

On top of that, I am very thankful for all the attendants and respondents that took part in the expert interviews, the brainstorming session, and only survey research, which was triumphant. Next to that, the outcome of the research would not have been as successful if it was not for the active involvement of my colleagues at ITDP. Finally, I am grateful for the support and feedback I received from Mr Sunarya, Ms van Nieuwkastele and Mr Ndlovu.

I hope you will enjoy reading this report and find the research outcome interesting.

Best regards,

Charline Dielen

Executive summary

This report is written on behalf of The Institute for Transportation & Development Policy (ITDP) Indonesia and functions as thesis report being part of the International Traffic Management bachelor degree at the NHTV Breda University of Applied Sciences. Online ojek, a motorcycle taxi that can be ordered via an app, was introduced in Jakarta in 2014. The rapid growth of online ojek usage has an undesirable impact on urban settings, and there is a lack of understanding on online ojek's user profile in Jabodetabek, the metropolitan area of Jakarta. From this, a central research question derived: *What is online ojek's user profile, corresponding travel motives and perception on public transport aspects, in order to provide guidance for public transport operators and metropolitan authorities on how to increase public transport usage amongst online ojek users in Jabodetabek?* The target group in this research is online ojek users in Jabodetabek.

The findings for each of the five phases are explained. Literature research and expert interviews are the research methods for the first three themes, for the fourth topic expert interviews with online ojek users and a brainstorming session amongst online ojek customers are organised and at last, online survey research is carried out.

1. Jabodetabek's trends that affect transportation

Jabodetabek is Jakarta's fast-growing metropolis through a growing and ageing population. One of the key restraints on the flourishing economy is the economic loss due to congestion. Sustainable awareness is a scarcely adopted motivation behind travel behaviour and owning a car or motorcycle is regularly regarded as status symbol, which could continuously trigger citizens to poses a private vehicle. Jabodetabek's governmental formation affects transportation developments drastically.

2. Transportation in Jabodetabek

Indonesia's capital faces one of the heaviest congestion levels in the world, catalysing noise and air pollution levels, health conditions, and overall liveability becoming progressively worse. Urban sprawl deteriorates especially the suburban settings. The major contributor to congestion in the city is a trend towards private and on-demand motorisation, due to the lack of public transport's quality and emergence of (online) on-demand services. Recent transportation projects; construction of Mass Rapid Transit (MRT) corridors, Light Rapid Transit (LRT) lines and an airport railway aim to reduce travel time, ease congestion, and increase public transport ridership.

3. Introducing online ojek

The online ride-hailing services repeatedly receives objection from conventional ojek drivers, whose income declined tremendously as a result of the popular becoming online ojek. The mode of transport offers significant flexibility and travel speed advantages on short distance, leading to rapidly increasing user rates. Some regard online ojek as an illegal mode of transport, since law prohibits two-wheeled public transport. Unfair competition and lack of safety are other reasons to oppose the informal transportation mode. Advocates of the service stress the need of the online service as requisite and addition to current transportation and the open market.

4. Insight into online ojek's user motivations

The online ride-hailing service is not perceived as a safe and comfortable mode for trips that last longer than 30 minutes. When using ojek for short distance journeys time and money can be saved. Suggestions to boost public transport user rates provided by the transport experts that utilise online ojek are: make public transport the quickest alternative, improve its reliability and advertise on it, increase the frequency, and improve on comfortability ad coverage area. Particularly mode integration, accessibility to stops and stations, more stops to increase the coverage area and quality of vehicles needs to be improved on rapid transit consisting of Bus Rapid Transit (BRT), also known as Transjakarta, and rail transit, which is called the KRL Commuter Line. Underperforming law enforcement is the underlying cause for inefficient single mode transportation and failing mode integration stated by the brainstorming respondents.

5. Online ojek's user profile specification

From the analysis on online survey results no distinctive subpopulations are identified, which demonstrates online ojek users in Jabodetabek being a homogenous population. Online ojek customers are a relatively young user group with most of them being in their late '20's. 40% have a car at their disposal. The largest share of online ojek adopters come from the respondents that used to travel by public transport before starting to utilise online ojek. The majority travels by online ojek to or within Jakarta, 55% commutes by online ojek. Predominantly, online ojek is utilised for first and last mile trips in combination with train and Bus Rapid Transit. Generally, online ojek users do not have good access to rapid transit, especially people from the suburbs. People from urban areas that use online ojek for the entire journey live closer to rapid transit, than part of trip users.

Guidance for public transport operators and local authorities are:

1. A pedestrian and cycling friendly environment around train stations would fulfil the wish of brainstorm attendants, which is how they described their ideal journey.
2. Half of all survey respondents uses online ojek in combination with public transport. Hence, collaboration and coordination between both modes of transport could optimise the efficiency of hub-spoke networks.
3. The minimum and maximum travel time and distance are 9 and 31 minutes and 2 and 11km respectively. The radius and length of time around public transport nodes can be used for location based promotions and advertising for instance.
4. Almost one third prefers a different mode during heavy rain. Shuttle services to public transit can be offered at busy public spaces when it is raining.
5. Long waiting time is 1 of the 4 most disliked aspects about online ojek. When waiting times go up due to regulations setting a maximum number of online ojek drivers, customers might shift to a different mode, like public transport.
6. Particularly pre-trip aspects of public transport, such as the accessibility to and waiting time at stops or stations, are considered most relevant. This can be part of a strategic approach through improving on these fields in order to attract more people to make use of public transport. Long waiting times can be tackled by higher frequencies and real-time information of public transport so that people can plan their trip more efficiently without having to wait for long periods of time.

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List of Abbreviations

BRT	Bus Rapid Transit
Dishub	Dinas perhubungan, Department of Transportation DKI Jakarta
DKI Jakarta	Daerah Khusus Ibukota Jakarta, Special Capital Region of Jakarta
IDR	Indonesian Rupiah (IDR 1,000 = Euro 0.07 as of 5 April 2017)
ITDP	Institute for Transportation & Development Policy
Jabodetabek	Jakarta, Bogor, Depok, Tangerang, Bekasi; metropolitan area of Jakarta
MRT	Mass Rapid Transit
NMT	Non-Motorised Transport
TOD	Transit-Oriented Development
TJ	Transjakarta

1. Research design

1.1 Introduction

This report focuses on online ojek's user profile in Jabodetabek. Online ojek is a motorcycle taxi that can be ordered via a mobile application. It is a relatively new mode of transport as it was founded in 2014. Jabodetabek is an abbreviation for the municipalities of Jakarta, Bogor, Depok, Tangerang and Bekasi. Jakarta is the capital and largest city in Indonesia. The megacity is estimated to have 10.66 million inhabitants and the whole metropolitan area of Jakarta, so-called Jabodetabek, has a population of over 30 million (World Population Review, 2017).

In the past decade rapid economic growth lead to high levels of consumerism, however this also simultaneously deteriorated urban environmental qualities such as air/noise pollution, congestion levels etc. The infrastructure developments in the late '90s have not kept up with escalating traffic demand (Indonesia Investments, 2016). Heavy congestion is faced by every Jakartan on a daily basis, and The Guardian even states that on average residents spend 10 years of their life in traffic (Van Mead, 2016). Jakarta is also known for the city with the world's worst traffic. An anonymous taxi in Jakarta driver added to that: "Jakarta is traffic". Poor quality of water management infrastructure also increases the risk of floods and therefore worsens the congestion levels.

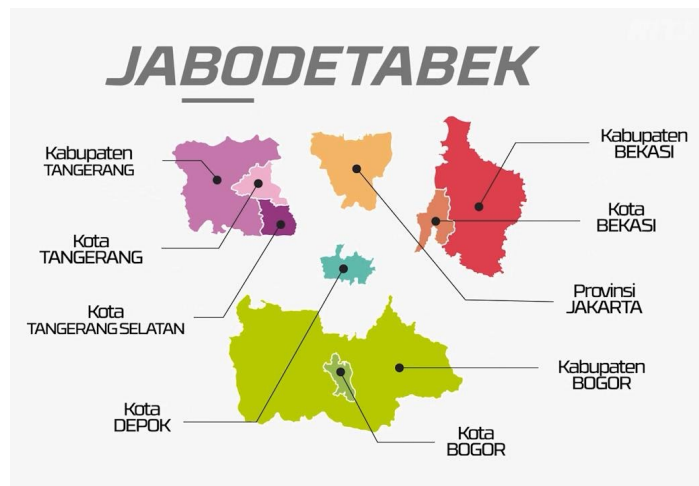


Figure 1 Exploded geographical map of Jabodetabek
Source: Aryanto Herbal, n.d.

In this chapter the following topics are discussed:

- Reading guide
- Institute for Transportation & Development Policy
- Problem statement
- Research goal and questions
- Scope, target group & stakeholders
- Methodology

1.2 Institute for Transportation & Development Policy

This research is conducted on behalf of The Institute for Transportation & Development Policy (ITDP), which is a non-profit organisation. The International Climate Initiative (IKI), which is part of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, financially supports ITDP. ITDP has more than 70 employees

and offices are located in Brazil, China, India, Indonesia, Kenya, Mexico and the United States. ITDP's vision is making cities more liveable, equitable and sustainable (ITDP Indonesia, 2016). Their core activity is to support governmental organisations on policy, research and transport projects (ITDP, 2017). The webpage of ITDP Indonesia is <http://www.itdp-indonesia.org/>.

ITDP Indonesia's office is situated in Jakarta, from there they work on projects across Indonesia on the following topics:

- Bus Rapid Transit: consult authorities on the implementation, operation, improvement and extension of BRT systems
- Non-motorised transportation: promote walking and cycling
- Transport demand management: car-limiting measures based on driving in city centres and regulated parking
- Transit-oriented development: consult governmental organisations on mixed-use, high-density and commercially-oriented development centred around a public transit stop, station or hub in order to optimally enhance access to public transport

1.3 Problem statement

The deteriorated issues in the metropolitan area forces politicians to make changes in favour of a more liveable and sustainable future. The National Urban Transport Policy is written to aim for more sustainable transportation.

Three corresponding targets are were set to be achieved by 2020:

1. Increase public transport share from 23% in 2010 to 32%
2. Increase travel speed from 8.3km/h in 2010 to 20km/h
3. Reduce greenhouse gas emissions by 26% (Sinaga, 2015)

The reduction of public transport usage consisting of bus and train transportation, and increase of motorcycle usage from 1982 is an on-going trend throughout Indonesia. A similar

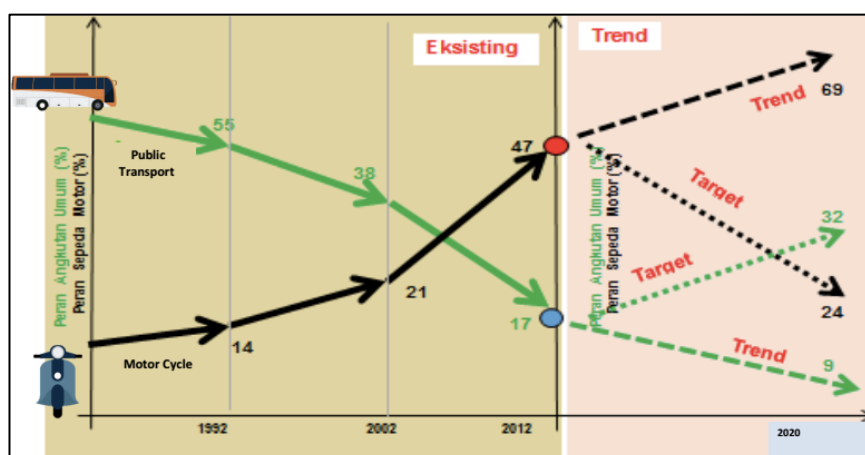


Figure 2 Modal split objective Indonesia
Source: Ministry of Transportation Indonesia, 2013

trend in Jakarta is envisioned. Moreover, the sharpest increase in sales of motorized vehicles accounts for motorcycles. Changes have to be made to counteract these developments. Not only motorcycle usage but also car usage has been increasing the past decades.

From 2014, an extra impulse incited staggering sales in the motorcycle industry. This was caused by the introduction of a new service, which is referred to as online ojek. Ojek is a motorcycle taxi, and this service can be ordered via an app. About the relatively new population group, online ojek users in Jabodetabek, is not much known with regard to socio-demographic information, travel behaviour and underlying motivations. An on-going discussion questions the legal settings of online ojek, but non-governmental organisations and authorities do not commence research to get to know the user group better.

The rapid expansion of online ojek's popularity causes new issues and further deteriorates existing ones. Not only ojek is causing the negative side effects of traffic, but also other forms of transportation like motorcycles and cars contribute to the environmental issues.

New and deteriorated issues related to online ojek emergence according to experts are:

- Perennial traffic jams, which has major adverse consequences on the economy, such as augmented logistics costs, unattractiveness for foreign investments, loss of time
- Online ojek attractiveness helps to catalyse the already growing level of noise and air pollution (, contributing to global warming, affecting the quality of the environment and public health) due to urbanisation and greater individual transport demand. A visible example of deteriorated air quality is that motorcyclists regularly use masks to protect themselves from the bad air quality.
- Conflicts between traditional ojek drivers and online ojek drivers, due to the decreased revenue of traditional ojek chauffeurs
- Police recorded that motorcycles were involved in more than 70% of fatal traffic accidents that occurred in Indonesia, based on figures from 2010 to 2014 (The Jakarta Post, 2015). The high number of motorcycles involved in traffic accidents could increase and the severity of casualties could deteriorate when safety procedures are not followed up. Online ojek drivers and regular motorists do not follow simple rules which are known world wide such as stopping at red lights and halting for pedestrians which are rules in the traffic code, on top of that safety measures such as having a helmet strap that works are not followed.

The increasing number of ojeks on the roads is not in line with ITDP's vision as well as the targets of the National Urban Transport Policy. The phenomenon and the best approach to ban or limit ojek usage has become the central topic in a public on-going debate, mainly due to the urban conditions and urgency of this issue. The magnitude of the problem and the lack of scientific evidence on best practice strategies to limit ojek usage and promote modal shift to public transport caught the attention of ITDP.



*Figure 3 Endless traffic jams in Jakarta
Source: G. Ramadhan, 2017*

From this, the research problem is defined, which is: *“The rapid growth of online ojek usage has an undesirable impact on urban settings, and there is a lack of understanding on online ojek’s user profile in Jabodetabek”*. The involvement and interest of a wide variety of industries and governmental organisations in this subject makes the research more fascinating.

1.4 Scope, target group & stakeholders

In this subchapter the scope, target group and stakeholders of the research are defined.

1.4.1 Scope

The traditional or conventional ojek is excluded. This group is excluded, because:

- The research aims to understand the impact online ojek emergence has on other modes of transport.
- The debate about the legal setting of ojek is a topic that is interesting to include. The discussion is stimulated due to the popularity of online ojek and not conventional ojek.
- It is easier to conduct online survey research when knowing the target group has a smart phone with access to the Internet.
- ITDP recommends looking into online ojek only.

Jabodetabek is chosen as geographic area, because daily travel patterns mostly show high intensities from Bogor, Depok, Tangerang and Bekasi towards Jakarta in the morning and in reverse direction in the evening. The number of citizens travelling outside Jabodetabek on a daily basis is minor (BPTJ, 2015).

1.4.2 Target group

Online ojek users travelling mostly within Jabodetabek is the main target group. Only that group is researched. The online ojek service operators in Jabodetabek are: Gojek, Grab and Uber. The ride-hailing apps offer other services than personal transport by motorcycle, such as personal transport by car, home-delivery of groceries, meals and parcels etc. In this report the term online ojek users or customers is used to indicate the people that use personal transport by motorcycle. This was opted for, because doing research on personnel transport is preferred over logistics and services activities of online ojek by ITDP.

1.4.3 Stakeholders

To ensure the effectiveness of the research all stakeholders have to be defined. The research being conducted is of interest for all stakeholder groups. Each group has its own field of interest, which needs to be covered in the research paper. The key stakeholder groups are:

- Institute for Transportation & Development Policy
- Governmental organisations in Jabodetabek, such as The Ministry of Transport and Department of Transport
- Public transport operators in Jabodetabek, for instance Transjakarta, Jakarta’s bus rapid transit operator and KRL Commuter Line, Jabodetabek’s rail operator

1.5 Research goal & research questions

From the problem statement, the research goal derived, which is:

“Uncover a set of recommendations for public transit providers and local authorities, which could instigate a modal shift from online ojek to public transport, through analysing the online ojek’s user profile and their key values of formal public transport in Jabodetabek.”

The central research question is defined as:

“What is online ojek’s user profile, corresponding travel motives and perception on public transport aspects, in order to provide guidance for public transport operators and metropolitan authorities on how to increase public transport usage amongst online ojek users in Jabodetabek?”

The research questions are:

1. What are Jabodetabek’s transportation trends based on demographic, economic, social-cultural, technological, ecological and political aspects, that are significant in order to understand the context of the transportation environment and its future prospects?
2. What is the impact motorisation and urban sprawl have on current transportation settings and what are the characteristics of on-demand, public and private transportation in Greater Jakarta?
3. What are online ojek’s predecessors, reasons for success, and legal setting instabilities in Jabodetabek?
4. Which subpopulations can be identified as significantly different online ojek user groups in Jabodetabek, and what is their corresponding user profile and validation on formal public transport aspects?

1.6 Methodology

This chapter shows the research method for each research question that is divided into multiple sub research questions. Also, the objective and the reason why the research method is opted are described. The different research methods are desk research, expert interviews, expert interviews with online ojek user, brainstorming session and online survey.

1.6.1 Research question 1

Research question	Research method	Chapter number
1. What are Jabodetabek's transportation trends based on demographic, economic, social-cultural, technological, ecological and political aspects, that are significant in order to understand the context of the transportation environment and its future prospects?	Desk research	2
1.1 What are Jabodetabek's transportation trends based on demographic aspects in the context of transportation?	Desk research	2
1.2 What are Jabodetabek's transportation trends based on economic aspects in the context of transportation?	Desk research	2
1.3 What are Jabodetabek's transportation trends based on social-cultural aspects in the context of transportation?	Desk research	2
1.4 What are Jabodetabek's transportation trends based on technological aspects in the context of transportation?	Desk research	2
1.5 What are Jabodetabek's transportation trends based on ecological aspects in the context of transportation?	Desk research	2
1.6 What are Jabodetabek's transportation trends based on political aspects in the context of transportation?	Desk research	2

Table 1 Methodology Research question 1

With use of desk research and an expert interview, contextual understanding on demographic, economic, social-cultural, technical, environmental and political trends in the context of Jabodetabek's transportation is gained. Useful sources are found via the Internet and via ITDP's database. Desk research is an easy and quick way to gain knowledge.

1.6.2 Research question 2

Research question	Research method	Chapter number
2. What is the impact motorisation and urban sprawl have on current transportation settings and what are the characteristics of on-demand, public and private transportation in Greater Jakarta?	Desk research and expert interviews	3
2.1 What is the impact motorisation and urban sprawl have on transportation in Jabodetabek?	Desk research	3
2.2 What are the characteristics of on-demand transportation in DKI Jakarta?	Desk research and expert interviews	3
2.3 What are the characteristics of public transportation in DKI Jakarta?	Desk research and expert interviews	3
2.4 What are the characteristics of private transportation in DKI Jakarta?	Desk research and expert interviews	3

Table 2 Methodology Research question 2

Motorisation and urban sprawl have a major influence on today's traffic in Jakarta, which is the reason why both phenomena are analysed. Transportation characteristics are subdivided in on-demand, public and private transport in which each mode is described. Desk research sources are mostly online newspaper articles.

Expert interviews

The expert interviews are held amongst professionals that work in public and private organisations in the transport field. From 9 March until 20 April the interviews took place. The research method has the aim to gain background information on the characteristics of policy, characteristics and developments within Jabodetabek's transport sector. The

interviewees are seeking to minimize the traffic issues Jakarta faces. The interview structure can be found in Appendix I.

The reasons why expert interviews as research method is opted for, are:

- During the exploratory phase time can be saved as the expert is familiar with the field and related recent developments
- The expert has specific insight in processes, behaviour, strategies etcetera
- The interviewee is often involved and motivated to help and exchange information
- The interviewee has an extensive network, and therefore he or she might know contact persons from who extra in-depth knowledge can be gained. An expert interview can therefore easily lead to other interviews

In order to answer this research question and research question 3, expert interviews are carried out. The experts work in the transport industry and are approached via ITDP's employees that recommended interviewing them. Mr Arouffy and Ms Nugrahaini were interviewed to find out more about the political context and developments on transportation. Mr Kusuma was approached to find out more about related research projects and methodology. At last, Mr Sunarya conducted research on ojek, which made it interesting to speak about his research methods, results and possible recommendations for this research.

Mr Arouffy, Head of land transportation, Dinas Dinas Perhubungan Dan Transportasi Provinsi DKI Jakarta

Dinas Perhubungan Dan Transportasi Provinsi DKI Jakarta (Dishub) is a local government body responsible for the transport system in DKI Jakarta. Their vision is to provide reliable, modern and internationally competitive transport services, with public transport as the main service. The interview was held on 22 March 2017.

Mr Kusuma, Research professor, Transport Laboratory at the University of Indonesia

An interview took place with Mr Kusuma, who holds a PHD degree in transportation. The transport Laboratory of the University of Indonesia conducts transport research on behalf of private companies and authorities in Indonesia. He was interviewed on 9 March 2017.

Mr Sunarya, Transport and Spatial Planning Expert, Cardno Emerging Markets

In 2015, Mr Sunarya commenced his 6-month master thesis at the Technische Universität Berlin. The topic of his thesis is "Smart Transport Informalities: How Smart Ojek Emergence Counterbalance Jakarta Transport Settings". The research seeks to understand the operational differences between online ojeks, so-called smart ojeks, and traditional ojeks. The additional objective is to identify integration possibilities of smart ojeks into the public transport system. The interview was conducted on 23 March 2017 and 20 April 2017.

Ms Nugrahaini, Head section of in-route public transport, Dinas Dinas Perhubungan Dan Transportasi Provinsi DKI Jakarta

The interview with her took place on 17 March 2017.

1.6.3 Research question 3

Research question	Research method	Chapter number
3. What are online ojek's predecessors, reasons for success, and legal setting instabilities in Jabodetabek?	Desk research and expert interviews	4
3.1 What is the history behind online ojek?	Desk research and expert interviews	4
3.2 What is the key to online ojek's success?	Desk research and expert interviews	4
3.3 What are the motives behind the ongoing debate on online ojek's legal setting?	Desk research and expert interviews	4

Table 3 Methodology Research question 3

To understand the current debate about online ojek as legal mode of transport, it is important to explain the history and reasons for success of the mode. The three sub research questions provide a first glance on the informal mode of transport. Desk research provides easy and quick access to information on online ojek. The reasons to choose for expert interviews as source of information are the same as described in subchapter 1.6.4.

1.6.4 Research question 4

Research question	Research method	Chapter number
4. Which subpopulations can be identified as significantly different online ojek user groups in Jabodetabek, and what is their corresponding user profile and validation on formal public transport aspects?	Expert interviews with online ojek users, brainstorming session and online survey research	5 & 6
4.1 What are the online ojek's user motives in Jabodetabek?	Expert interviews with online ojek users and brainstorming session	5
4.2 Can online ojek subpopulations be distinguished in Jabodetabek	Online survey research	6
4.3 What is the user profile of online ojek users or the different subpopulations in Jabodetabek?	Online survey research	6
4.4 What is the validation on public transport aspects of online ojek user or the different subpopulations in Jabodetabek?	Online survey research	6

Table 4 Methodology Research question 4

Subsequently, research question 4 is answered by means of qualitative research and quantitative research. The research question aims to identify online ojek user profile(s) in order to provide specific information on the target group about which recommendations to public transport operators and local authorities will be delivered. When the online ojek user profile(s) is/are known, it will also be easier to understand their considerations and perception with regard to other modes of transport. From the outcome of different variables recommendations are composed.

Expert interviews with online ojek users

The expert interviews took place from March 15th until March 17th 2017.

Using online ojek at least once a week and working in the transport field, but not focussing on online ojek during work activities are the selection criteria for the expert interviews with online ojek users. Since the 4 interviewees are working in the field, they are expected to have a strong opinion upon the interview topics and they will find it easy to understand the context of the questions, therefore less explanation is required. The objective of the

interviews is gaining a first overview on the characteristics of online ojek users. Secondly, their input on room for improvements of public transport is asked for. This method is chosen to get in-depth information about the motivations behind online ojek user's travel behaviour. The entire interview schedule can be found in Appendix V.

Brainstorming session

On Wednesday the 29th of March from 5:00 PM till 6:30 PM the brainstorm event was organised amongst 6 employees from 5 different industries. The brainstorming guide is enclosed in Appendix VIII.

Via acquaintances possible respondents were approached to see in which industry they work and if they meet the following requirements:

1. Utilising online ojek at least once a week
2. Possession of a decent level of speaking and writing in English, thus they need to be able to make themselves understandable in English

From the available respondents a selection has been made in order to form a group with individuals from a wide variety of industries.

The three main objectives of the brainstorming session are:

- Get more insight in ojek user's travel behaviour and the motivations behind ojek usage
- Test proposed measures and improvements to stimulate public transit usage on increased public transport demand of the respondents

Brainstorming is chosen as a research method. It is important to understand why this method is preferred. The reasons are:

- It provides a clear picture of ojek user's preferences
- The ideas are likely to gain support from other ojek users as the respondents fall within the target group
- Build on each other's creativity
- The participants from different industries bring different knowledge and different experiences together
- Creating new and innovative ideas through out-of-the-box thinking
- No idea can be criticized or rejected resulting in many and interesting ideas

Online survey research

A pilot survey is conducted to test the understandability of the survey questions and answers. The survey is shared on social media and handed out during a transport event. SurveyMonkey is the online software used to carry out and analyse the survey. Routing is used to direct the respondent to the right survey in terms of preferred language (Indonesian or English). Subsequently, screening is used to exclude people that use 0 times a week online ojek and live or travel outside Jabodetabek. With means of the survey outcomes the online ojek user's profile and demand for improvements on public transport can be quantified, which is the aim of this research section. From the 27th of April until the 8th of May 2017 the online survey was accessible online. The entire survey can be consulted in Appendix XIV.

The motivation for selecting online survey research as suitable research method is:

- In this way the variables can be quantified.
- Mr Sunarya recommends organising online rather than on-street survey research. He expects that it cost less effort and money to do the survey online. Mr Sunarya found only 15 to 20 respondents per day, and he was surveying the whole day from the early morning to the late evening.
- According to Mr Sunarya, Indonesians are often willing to help out so via all contact person’s social media channels many people can be reached.

1.7 Reading guide

The reading guide offers the reader a brief overview on the structure of the report. The report structure is ordered based on the research questions, which are included in the table below as well as the related research methods and chapter numbers.

Research question	Research method	Chapter number
1. What are Jabodetabek’s transportation trends based on demographic, economic, social-cultural, technological, ecological and political aspects, that are significant in order to understand the context of the transportation environment and its future prospects?	Desk research and expert interviews	2
2. What is the impact motorisation and urban sprawl have on current transportation settings and what are the characteristics of on-demand, public and private transportation in Greater Jakarta?	Desk research and expert interviews	3
3. What are online ojek’s predecessors, reasons for success, and legal setting instabilities in Jabodetabek?	Desk research and expert interviews	4
4. Which subpopulations can be identified as significantly different online ojek user groups in Jabodetabek, and what is their corresponding user profile and validation on formal public transport aspects?	Expert interviews, interviews with online ojek users, brainstorming session and online survey research	5 & 6

Table 5 Research questions and methodology

Chapter 2 until 4 offer contextual information in order to understand chapter 5 and 6 better. Within chapter 2 the DESTEP method is used to describe the urban setting and future trends of Jabodetabek. Demographic, economic, social-cultural, technological, ecological and political trends related to transportation are discussed. Chapter 3 zooms in on urban sprawl, motorisation and passenger transportation in Greater Jakarta. The fourth chapter clarifies the historical context and characteristics of online ojek’s predecessors. Subsequently, the key to online ojek’s success is explained and the discussion on the legal setting is explained.

Chapter five outlines the expert interview and brainstorm structure and results. A first view on ojek user’s profile becomes detectible from the expert interview analyses. The second part of chapter 5 about the brainstorming session provides individual and collective motives for travel behaviour and ideas to stimulate public transport usage. Chapter 6 elaborates on the survey results, which are divided into demographics, travel behaviour and preferences. Furthermore, correlations between subpopulations and correlations are analysed. The conclusion combines the relevant survey results with related motives derived from chapter 2 until 5 in order to indicate online ojek’s user profile, motives and preferences. The second part of the conclusion provides guidance for public transport operators and local authorities on how to stimulate public transport ridership based on the research outcome.

2. Jabodetabek's trends that affect transportation

2.1 Introduction

The developments in the past have proved the influence of new products and services in the transport industry. The introduction of lease contracts for motorcycles had a major impact on Jabodetabek's modal split from 2002. The public transport share halved from 2002 until 2010 and the number of motorcycles on the streets grew exponentially during that time frame. Not only this, but also the impact of motorcycle taxis on public transportation has surprised many (Gituri, 2017). This in combination with the new Mass Rapid Transit and Light Rapid Transit system to be in operation after 2020, makes forecasting the future of Jakarta and its transportation hard. Therefore, only developments in the near future are predicted.

The DESTEP method is used in this chapter in order to outline the demographic, economic, social-cultural, technical, ecological and political developments that can be related to transportation in Jabodetabek. Obtaining external insight in this South-Asian developing metropolis is vital to understand the trends behind transportation in Jabodetabek.

2.2 Demography

The population grew more rapidly between 2000 and 2010 than between 1990 and 2000. The last census was held in 2010, thus no recent data is available on population size. The expectation is that from 2015 the population growth rate will steadily decline, however population increase is expected to continue, likewise in other Indonesian urban centres (Cox, 2011).

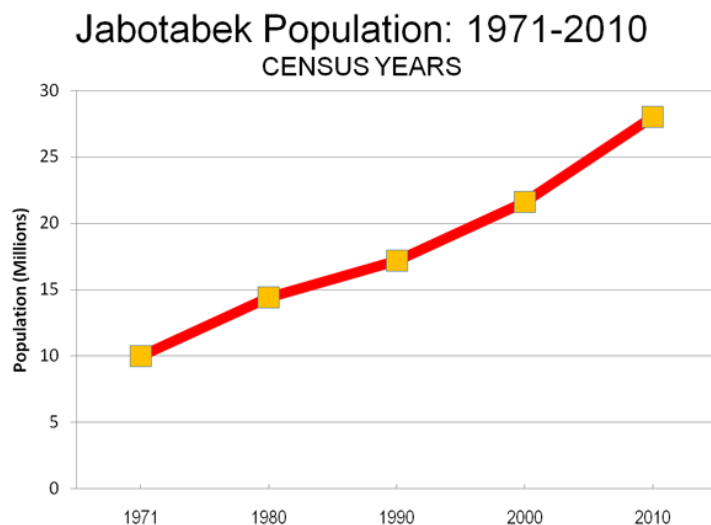


Figure 4 Jabodetabek's population size
Source: New Geography, 2011

The Indonesian age pyramids in figure 5 show the change over time. In 2035 the projections state a growing number of people in their late 40s and above. There might be a slight undercutting of people under 20 years old (UNFPA, 2011).

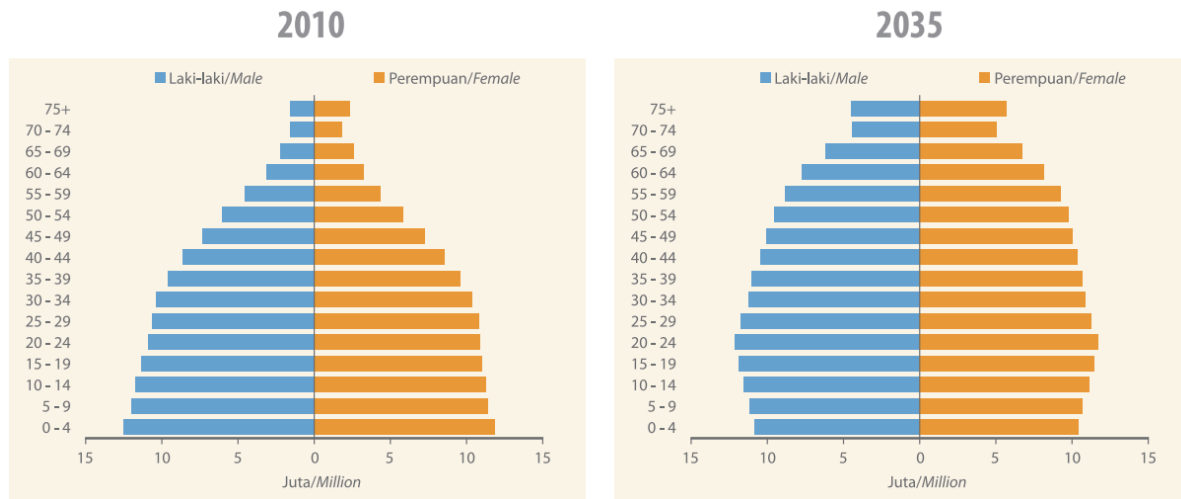


Figure 5 Indonesian age pyramids, Source: UNFPA, 2014

The increase of population size, older becoming population and upturn of the upper-middle and high-income class will increase the need for significant improvements in capacity and quality of the current transport network (Deloitte, 2015).

2.3 Economy

The figure below shows year-on-year economic growth until the third quarter of 2016 (Central Statistics Agency (BPS), 2016). This has led to higher rates of consumerism.

GDP growth rate 2011-2016 (in %)

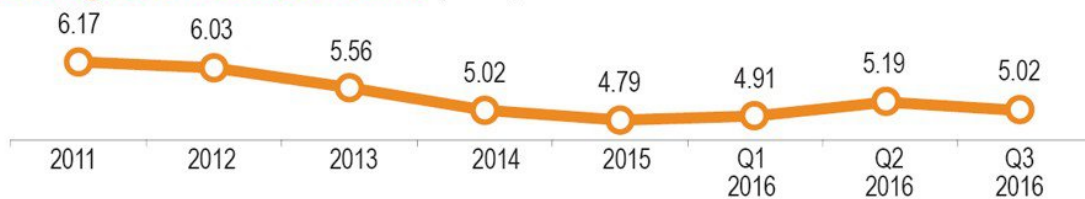


Figure 6 GDP growth rate Indonesia, Source: Badan Pusat Statistik, 2016

The current traffic conditions limit economic growth, social interaction, and overall development, which go hand in hand with augmented awareness for these restraints. The annual loss of traffic congestion measured in terms of time value, fuel consumption, and health conditions is more than 900 million Euros per year, and there is no indication that this number will decrease within the coming decade (World Bank, 2017). Additional shared awareness motivates private and public organisations to change Jakarta's environment into a more liveable one, and the government on an annual basis is investing more money in infrastructure.

The forecast is that Indonesia's GDP will grow 5% per annum from 2016 until 2020. This is supported by the upturn of consumer demand and infrastructure investments (Badan Pusat Statistik, 2016).

As shown in the graph below, until 2014 the middle-income class increased proportionally and the higher income class doubled in 5 years. A steady rise in income per capita is predicted until at least 2035. This will lead to a higher spendable income, increased consumption levels and vast needs for infrastructure development (UNFPA, 2014).

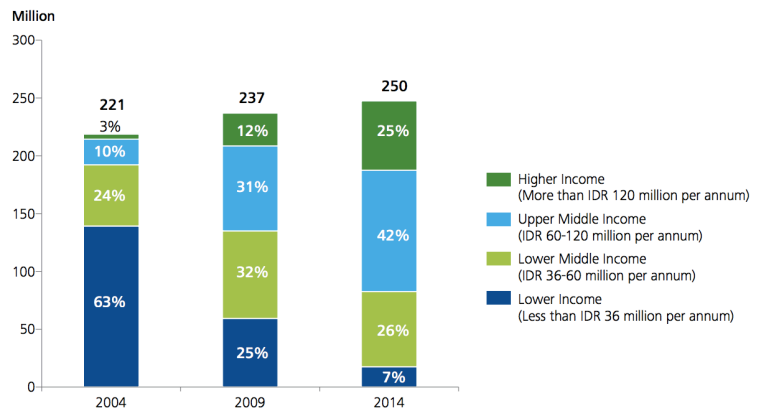


Figure 7 Population demographics, Source: Deloitte, 2015

2.4 Social-cultural

Yet, possession of a car and motorcycle is perceived as a high status symbol and comfortable mode, which drives up the sales in the automotive industry. It makes it hard to realize a modal shift from car and motorcycle users. More sustainable awareness among the new generation might weaken the perceived feelings as status symbol.

In the past new frameworks and services, have shown the elasticity to change mode. Two examples indicate the flexibility:

1. The introduction of credit schemes for motorcycles had a major impact on Jabodetabek's modal split from 2002. Suddenly, people from the lowest income class could afford buying a motorcycle. The public transport share halved from 2002 until 2010 and the number of motorcycles on the streets grew exponentially during that time frame (Gituri, 2017).
2. Not only this, but also the impact of the introduction of motorcycle taxis or so-called ojek on public transportation has surprised many (Gituri, 2017).

Nonetheless, both developments might be the multiplier effect of the weakening sense of appreciation for public transport due to the system's underperformance and coverage area.

2.5 Technology

In a technological perspective, the IT industry is growing rapidly in Jakarta. The emerging online market demands smart and efficient IT software. On the online market a wide variety of products and services can be ordered, such as food, groceries, cleaners, massages, transportation of personal goods, etcetera. All of this can be purchased through an online application that in most cases offers multiple online services. The ease of use and avoiding being stuck in congestion is the key behind their success. Therefore, often for just one product typically transported by ojek many kilometres are covered. It is disputable whether the deliveries of these goods and transportation to carry out the services have a positive impact on traffic circulation and its environmental side effects. It is inevitable that the online market will become more popular in the future, which goes hand in hand with more trucks, and ojek on the street.

2.6 Ecology

The high urbanisation rate of Jakarta has sprawled the metropolitan area vastly from the '70s (World Bank, 2017). The lack of political restraints on low-density spatial development has transformed outskirts into areas, which are not covered by public transport (Adiwinarto, 2016). The growth of the population is in correlation with the expansion of suburb and exurbs. The graph is indicating population growth during the period 2000-2010.

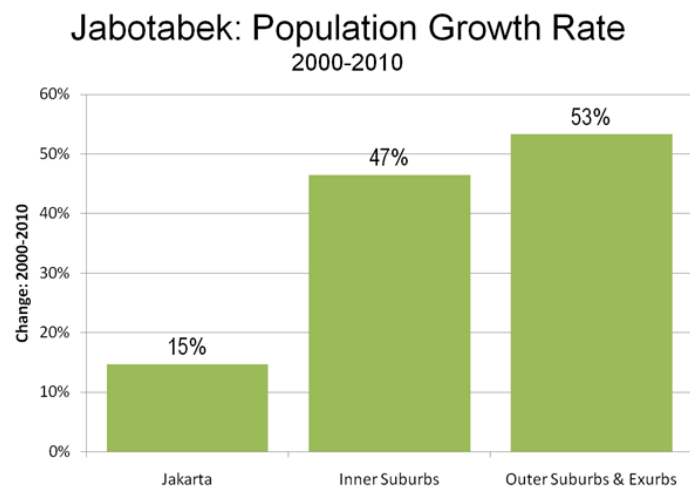


Figure 8 Population growth rate
Source: New Geography, 2011

Policymakers on spatial development try to promote mixed-use and high-density environments around transit stations. The promotion for such spatial development will continue in the future to prevent further urban sprawl of Jakarta (Adiwinarto, 2016).

2.7 Politics

Jakarta has its own governor and despite the democracy he has a lot of influence on making important decisions. Therefore, the political climate is quite unstable due to newly elected governors with different mind-sets that can change over the ruling period as well. Moreover, the corrupt and non-transparent bureaucracy attenuates progressive development and innovation (Indonesia Investments, n.d.).

A long-term development plan, a so-called RPJPN is written by the national government. The vision for the period 2005-2025 is to establish a country that is developed and self-reliant, just and democratic, and peaceful and united (Indonesia Investment, n.d.). The word

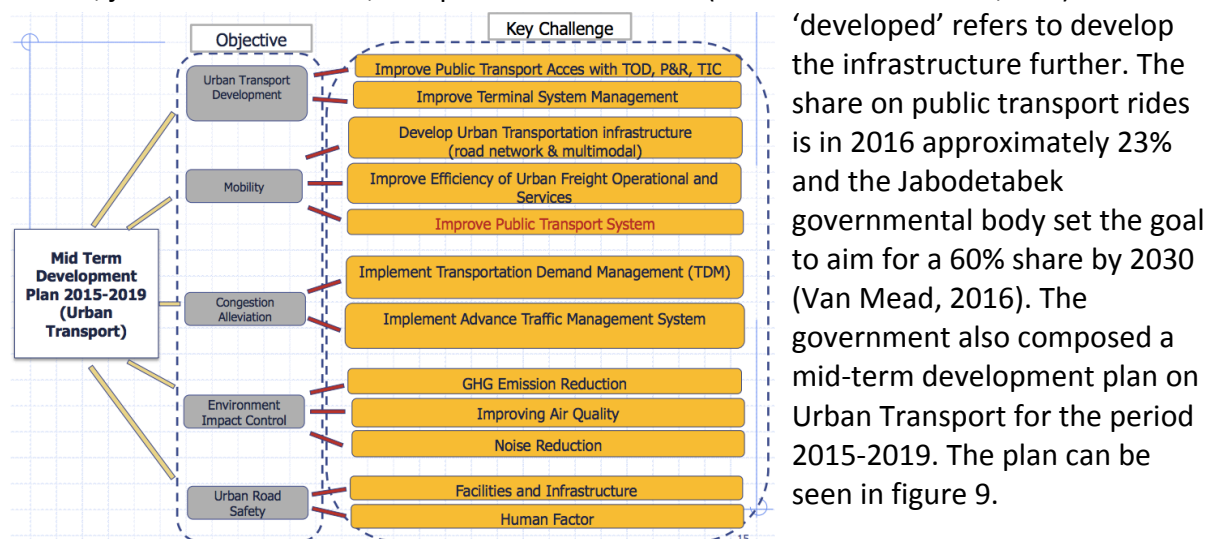


Figure 9 Mid-term development plan urban transport
Source: Ministry of Transportation Indonesia, 2015

‘developed’ refers to develop the infrastructure further. The share on public transport rides is in 2016 approximately 23% and the Jabodetabek governmental body set the goal to aim for a 60% share by 2030 (Van Mead, 2016). The government also composed a mid-term development plan on Urban Transport for the period 2015-2019. The plan can be seen in figure 9.

The government tries to implement transit-oriented development (TOD). TOD is characterised by: walkable distances, high-density centred around transit stations and mixed-use environments. As of 2016, the policy and implementation is not yet in place if global TOD guidelines are used as point of reference. The concept is intended to make cycling and walking for short-distance trips favourable and public transport practical for the longer journeys.

The legislation and developments on transportation will change until 2020. More sustainable spatial concepts are likely to be better applied than as of now. Nevertheless, political fluctuations influencing the transport vision and progress of major transport projects will be the determining factor for the future.

2.8 Conclusion

The older residents becoming the mean of the population, and augmenting population drives up the need for more efficient and qualitative transportation in Jabodetabek.

Indonesia's economy is predicted to flourish until at least 2035. Higher consumerism and investments support the economic growth. Jakarta's key restraint for economic growth is the traffic conditions. The annual economic loss due to congestion is 900 million euros per year and forecasts predict a growing amount within the coming decade.

More sustainable awareness among the new generation might weaken the perceived feelings for car and motorcycle ownership as a status symbol. The shift to another mode is hard to promote among this user group, also with regard to the flexibility of travelling when owning a motorised vehicle. Nevertheless, the willingness to shift mode has been proven in the past twice quite recently, with major fluxes from one shift to the other.

The beneficial impact of the emerging online market on traffic flows and environmental conditions is questionable. The number of logistics vehicles is likely to increase in the future due to growing online industries.

Continuation of urban sprawl is counteracted by implementation of sustainable spatial development policies. In this way, infrastructure can be developed in high-density environments, making investments more profitable and the population is better served in terms of amenities and transportation.

Legislation on transportation and related industries will change drastically in the coming years. This is because fluctuations in the governmental formation influence the transport industry vision and progress on major transport projects, moreover the decisive factor for Jabodetabek's transportation in the future.

3. Transportation in Jabodetabek

3.1 Introduction

The current situation in terms of infrastructure and its usage, are described for each mode of transport in the Jabodetabek region. The modal split in 2010 and corresponding objectives for 2030 can be envisioned in the figure on the right. Private car and motorcycle transport is aimed to halve by 2030, and public and non-motorised transport is projected to double by 2030.

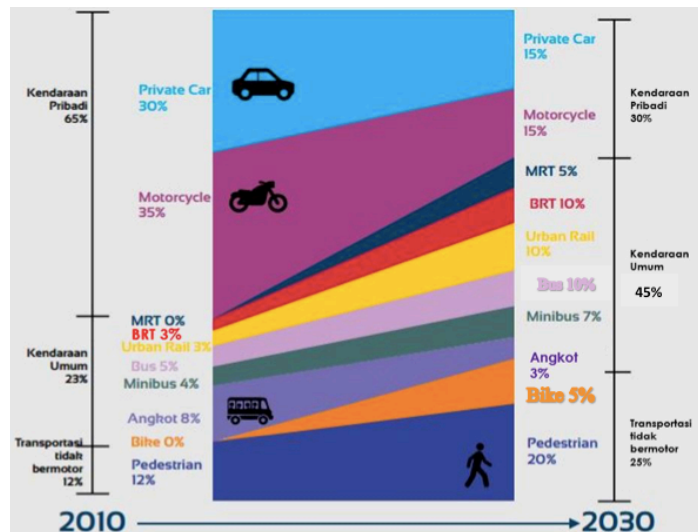


Figure 10 Modal split evolution objective Indonesia
Source: Ministry of Transportation, 2012

The current modal split and corresponding objectives are affected by transportation trends and related trends, such as urban sprawl and motorisation. These trends and the characteristics of the most common means of transport are consulted in the following subchapters.

3.2 Urban sprawl & motorisation

Greater Jakarta’s spatial developments in the past decades affect the citizen’s life and the environment negatively. Urban sprawl is out of proportion with its adverse side effects. Acquiring land for compact and mixed-use development from private landowners is challenging for the government by reason of the legislative framework constraining the ease of land purchase. The restriction catalyses urban sprawl initiated by private investors. Newly developed areas and expanded suburbs are lacking a sufficient coverage by public transport, water facilities etc. The walkability of areas to amenities and public transit is reduced to a minimum in the suburbs. Liveability is the major deteriorated factor (Verghese, 2016).

Engineering capabilities and policy commitment are no longer the principal way to move Jakarta forward. Moreover, modification of prerequisite building components to aim for a liveable future is the strategy towards successful dense growth (Verghese, 2016). Cooperation between regional and local authorities is essential to fulfil the need for large-scale accessibility of the suburbs. In times of current increasing power of the regional autonomy, where cities’ and regencies’ political and social activities are gradually becoming more significant, the battle for suburban accessibility heats up and barriers to overcome political affiliation differences are restrictive (Dewi & Elyda, 2015).

Motorisation degrees staggered since credit schemes are introduced in 2002 and disposable income rises annually. The expendable salary increases as a consequence of a higher minimum wage and instigates a growing middle class. The status symbol related to vehicle

ownership plays a major but immeasurable role in the automotive industry's intensifying sales (Verghese, 2016).

In 2003 37.3 million trips per day were made in Greater Jakarta. Figure 11 excludes informal public transportation, such as ojek. The traffic flows increased by 58% to 59 million in 2010. Car traffic intensities are projected on the maps below to reflect on the situation in the future. The darker the red colour, the more congestion is predicted in 2020 (BPTJ, 2015).

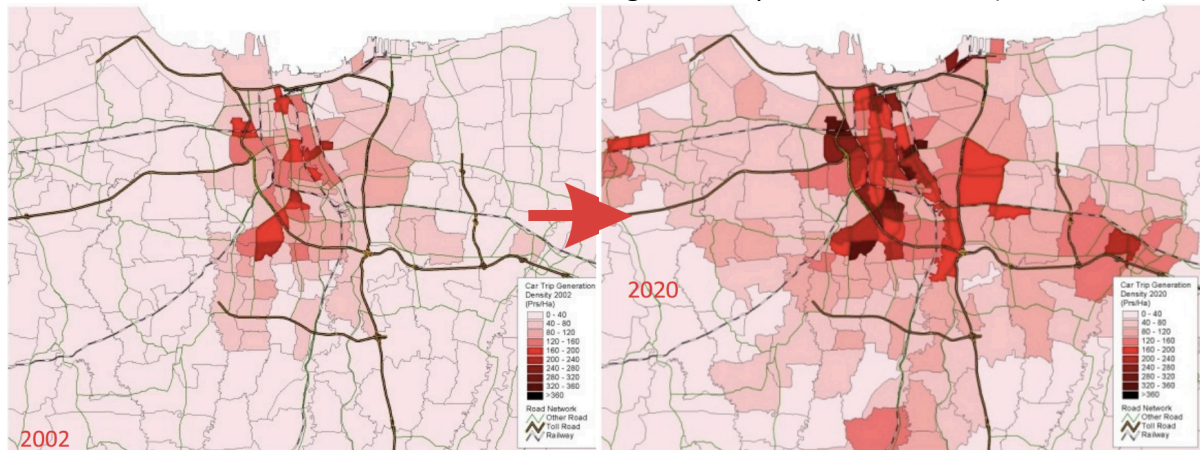


Figure 11 Car trip generation 2002-2020, Source: BPTJ, 2015

The modes of transportation in Greater Jakarta are subdivided into On-demand transport, Public transport and Private transport. Each mode characteristics are briefly outlined in the following subchapters.

3.3 On-demand transport

On-demand transport is mostly counted as public transportation in Jabodetabek. Nonetheless, noteworthy differences are:

1. The on-demand service will only be in operation if being ordered and it does not follow a fixed time schedule.
2. Mostly smaller vehicles are being used for on-demand transport.
3. On demand-transport is more flexible in terms of pick-up and drop-off locations.
4. The routing of on-demand transport is more flexible.
5. The different on-demand services can be ordered for yourself or these allow you to share a vehicle with others.

The general features of ojek, taxi, bajaj and shared transport are portrayed in this subchapter.

3.3.1 Ojek

Ojek is a motorcycle taxi service, which is seen as informal transportation or so-called paratransit. It holds an important share in Jabodetabek's transport industry, which mainly indicates the insufficient quality of formal transport services. Therefore, the gap between demand and supply is met by informal transport. Ojek can be subdivided into two forms: conventional and online ojek. Both ojek types are further specified in the following chapter.

3.3.2 Taxi

Grab, Uber and Go-Car are the key players in the online taxi market. Since 2014, online taxis are in operation in Jakarta. From 2014 onwards until the beginning of 2017 protests by conventional taxi drivers make regularly headlines, as unfair competition and the illegal position of ride-hailing apps were opposed (The Jakarta Post, 2017). For an online taxi you pay 0,1 euro per kilometre and travelling with a conventional taxi, such as Blue Bird will cost about 1 euro per kilometre. To combat large price differences between taxi operators, a minimum and maximum tariff will be set by Jakarta's Department of Transport in the future according to A.F. Sunarya. The minutes of the interview with Mr Sunarya are included in Appendix III.

3.3.3 Bajaj

Bajaj is a small three-wheeled vehicle, which can be stopped along the road. It fits a maximum of 3 people and does not work with a fare meter. Therefore, negotiation about the price has to take place. The orange ones are not powered by gas, which are because of that slowly replaced by blue bajajs that run on gas.

3.3.4 Shared transport

Numerous online apps offer ride sharing. Uber and Grab are amongst these that offer an online platform for it. Also, it is not unusual to commute on a daily basis with a friend or family member to work by sharing a vehicle, which can be either a motorcycle or a car.

3.4 Public transport

A metric developed by ITDP analyses the accessibility to public transport in large cities assuming that public transit within a 1 kilometre radius or 10 to 15 minutes walking distance is considered as transit coverage area. This tool is referred to as People Near Transit (PNT). In Jakarta decent public transportation is provided to 44% of the population. Whereas, public transport reaches only 16% of Greater Jakarta's population of about 28 million people (Institute for Transportation & Development Policy, 2016). Urban sprawl makes it hard to create well accessible rapid transit in the suburbs.

Mr Kusuma states public transport in Jabodetabek is subsidised and some areas are even served by fully subsidized public transport in the suburban areas of Jabodetabek (Kusuma, 2017). The minutes of the entire interview with Mr Kusuma can be found in Appendix II.

The most important values of public transport according to Mr Kusuma are:

1. Price
2. Travel time saving
3. Accessibility in terms of distance by non-motorised transport

From 2002 until 2010 motorcycle usage almost doubled at the expense of bus usage that more than halved (JUTPI, 2011). In this subchapter we look into the characteristics of each public transport mode.

Transportation mode for commuting, percentage

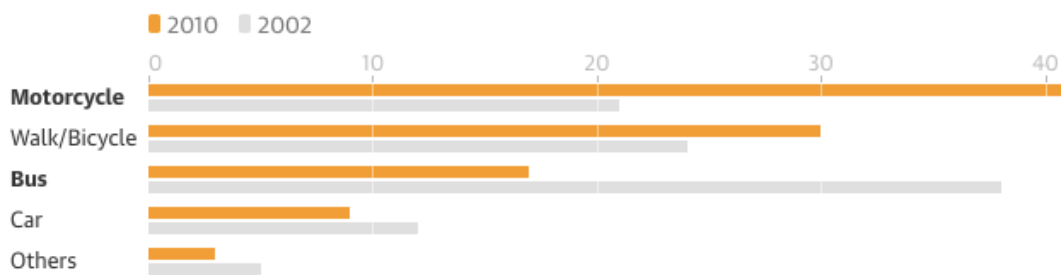


Figure 12 Transportation mode for commuters in Jabodetabek, Source: JUTPI, 2011

An airport railway will open in mid 2017, connecting Jakarta’s main airport with South Jakarta. Mass Rapid Transit (MRT) and Light Rapid Transit (LRT) systems, which are under construction as of 2017 will be in operation within the coming 5 years. These projects are expected to increase user rates of public transport and minimise travel times within Jakarta and from the suburbs to urban areas. It offers a different travel alternative, which could ease congestion levels.

3.4.1 KRL Commuter Line

The KRL Commuter Line enables intercity connections between DKI Jakarta and the regencies Bogor, Depok, Tangerang and Bekasi. The train stops frequently in Jakarta, which could be associated with the Dutch Sprinter train. In the suburbs only stations at strategic locations in large cities are passed, being comparable to Dutch railway’s Intercity train. In 2015 the last train line opened. The KRL Commuter rail system in Jabodetabek is owned and operated by the Ministry of Transportation. The transferability between commuter train and Bus Rapid Transit is not optimal; large walking distances, narrow footpaths and stairs make transferring uneasy (Gituri, 2017).

3.4.2 Transjakarta

Transjakarta is the local government-owned Bus Rapid Transit (BRT) operator. The first Bus Rapid Transit corridor opened in 2004. In the period 2004-2014 11 additional corridors began operation. Three new corridors are planned to be in operation in the coming years. The BRT covers an extensive network throughout the city enabling connections with the outskirts of the capital city. Integrated ticketing with Jakarta’s commuter trains eases the use of both modes in one trip since 2014. The overall capacity of KRL Commuter Line is larger than Transjakarta. Despite of the expanding fleet and network of Transjakarta over recent years, the number of passengers in relation to the fast-growing population only slightly increased.

Transjakarta’s BRT system has the following features: off-board fare collection, separated bus lanes on a few corridors, platform-level boarding and high frequency services. The goal by 2020 is to have 1 million BRT passengers per day. The cost for a Transjakarta ticket is about IDR 3,500 per trip. For some groups making use of Bus Rapid Transit is free of charge, such as low-income workers, thousand island citizens, disabled and students from low-income family (Gituri, 2017).

3.4.3 Angkot, Metromini/Kopaja, Shuttle bus / JR Connexion, Bus patas

Angkot buses have a capacity of about 15 people and drive a fixed route. Passengers are able to get on the bus and drop off at any location along the route. This bus type receives a lot of criticism, because you cannot rely on this mode being on time as it does not follow the timetable. Moreover, the safety of especially women has been questioned many times due to some sexual harassment incidents in which the driver or a male passenger were the perpetrators. Not only Angkot, but also Metromini/Kopaja, Shuttle bus/JR Connexion and Bus Patas are not envisaged as a safe means of transport to get around (Sufa, 2017).

Metromini's capacity is about 20 to 30 persons. Kopaja is a similar mode of transport to Metromini. Both modes are well known for their unsafety due to a lack of maintenance and drivers that do not follow traffic rules. Shuttle bus, JR Connexion and Bus patas look like touring buses. Mostly commuters are transported by these modes.

Dinas Perhubungan Dan Transportasi Provinsi DKI Jakarta (Dishub) is a local government body responsible for the transport system in DKI Jakarta. Their vision is to provide reliable, modern and internationally competitive transport services, with public transport as the main service. Ms Nugrahaini's role at this transport authority is head section of in-route public transport. Mr Arouffy is head of land transportation at Dinas Perhubungan Dan Transportasi Provinsi DKI Jakarta. The minutes of the interviews with both transportation experts can be found in Appendix IV.

Dishub is in the process of a major operation to have all conventional bus drivers under contract of Transjakarta. Conventional buses are so-called Metromini and Kopaja buses, which are private-owned. This is because the current bus drivers and their managers do not obey the law, which causes dangerous situations for the bus users, bystanders and the driver himself or herself. The driver has a fixed salary, which is not target-based, thus they only care about the income they gain from passengers and not about service level. If the minimum service level is not met, the wage is being reduced (Nugrahaini, 2017).

3.5 Private transport

Car and motorcycle usage increased the past decades, whereas walking and cycling declined. The four modes of transport are discussed in this subchapter.

3.5.1 Private car

The ministry of transport defined mode share objectives in 2012. Between 2002 and 2009 the number of cars increased by more than 25% (Badan Pusat Statistik, 2009). In 2010 the mode share was about 30% and is aimed to halve by 2030.

Measures are taken to reduce car usage, such as an odd-even schedule on the main trunk roads in Central Jakarta (The Guardian, 2016). This scheme allows cars with odd number plate digits only on odd dates and even number plates on even dates during peak hours only from 7:00 to 10:00 AM and 4:30 until 7:30 PM (Arouffy, 2017). Traffic circulation plans have enabled implementation of many one-way roads throughout Jabodetabek. At the moment

the government is revising the regulation on a proposed Electronic Road Pricing (ERP) system to limit car usage (Nugrahaini, 2017).

3.5.2 Motorcycle

Motorcycle flows intensified heavily in the past 15 years. Badan Pusat Statistik (BPS), the national statistics agency published a rapport in which it states that 75% of all vehicles in DKI Jakarta is a motorcycle (Badan Pusat Statistik, 2015). Extraordinary congestion levels boost travel by motorcycle to slalom in between cars in order to minimize waiting times. Furthermore, credit schemes catalysed the increase of people that could afford a motorcycle from 2002. The large gap between income levels leaves the motorcyclist no other competitive mode, as there are simply no better alternatives offering higher qualities and lower costs. Some routes will be faster by BRT than by motorcycle in Central Jakarta (Adiwinarto, 2016). Despite the public transport developments from 2004, the motorcycle usage doubled between 2002 and 2010 (JUTPI, 2011). Some main roads are banned from motorcycles in Jakarta. The government states not to expand the area until the ERP system and sufficient public transportation are in place (Wijaya, 2016).

3.5.3 Non-Motorised Transport (NMT)

Walking and cycling is aimed to cover 25% of all trips made in Jakarta by 2030 (World Bank Group, n.d.). Walking and bike infrastructure is not of a high standard in Jakarta. Street vendors often block access to footpaths; walkways are often narrow and used by motorcyclists to cut traffic jams. Also, the pavement of footpaths has often loose bricks and pot holes. The cycling network consists of a few cycle lanes across the city. Efforts are made to design new (separated) cycle lanes and improve footpaths. Next to that, NGOs and GOs are aim to advance the accessibility to and from transit stops by non-motorised transport.

3.6 Conclusion

Legislative limitations regarding land acquisition triggered private investors towards more urban sprawl, and simultaneously restricted authorities to develop a mixed-use and dense city. A sprawled Jabodetabek deteriorated suburban settings on multiple levels, such as liveability, accessibility towards public transport and amenities.

Public transport does not have the image of being an efficient, well accessible and entirely safe mode of transport, which is the main reason for the diminishing popularity of public transit. Correspondingly, the transferability between Bus Rapid Transit and commuter train is of insufficient quality. Recent projects, such as the airport railway, MRT and LRT can increase public transport ridership, minimise travel times, and ease congestion within Jabodetabek. Rapid motorisation and urbanisation impacted the congestion and environmental conditions of Jabodetabek heavily. With Jakarta being the centre of this metropolis, the city is expected having a hard time to absorb the intense traffic flows anymore within a couple of years.

The relatively new online transport market, still gains a lot of criticism from the people involved in the traditional market of transportation. Nevertheless, less resistance and more acceptances towards online taxi and ojek are evident. The most important factors of public transport according to Mr. Kusuma are price, travel time saving, and accessibility to transit.

4. Introducing online ojek

4.1 Introduction

The emergence of online ojek since 2014 has a historical connection to the bicycle. Conventional ojek lost its popularity to online ojek. The downside of this online ride-hailing service is that the attractiveness of this mode of transportation instigates public and political disturbance on online ojek's legal setting. All these topics will be elaborated upon in this chapter.

4.2 Conventional ojek

The conventional ojek finds its roots in the bicycle taxi, which was a popular mode of transportation in rural areas as gap filler for the low presence and quality of public transport. The popularity rural service was noticed by urban citizens and motivated them to introduce a similar service in the touristic areas of Jakarta in the '30's. The coverage area expanded throughout Jakarta over time, also provided jobs to the under qualified people. Currently, this bicycle taxi still exists in northern Jakarta (Sunarya, 2017).



Figure 13 Bicycle taxi in Jakarta, Source: Wikibooks, n.d.

The popularity of the bicycle taxi was challenged in the 50s because customers wanted to travel longer distances. Motorcycles replaced the bicycles in order to serve that customer need. Informal regulations were made to appoint each zone to a different ojek group. Each ojek driver works for one group, and is only allowed to pick up customers in the assigned area. For drivers, it was ideal to combine driving ojek with another job (Sunarya, 2017).



Figure 14 Ojek stand at Thamrin City Mall

Since online ojek became the most popular, there have been some incidents between traditional ojek drivers and online ojek drivers. The territory-based ojek groups find it hard

to tolerate the online ride-hailing service in their areas and its decreasing the traditional ojek driver's wages. To the customer, the ease of use and not having to bargain about prices is a huge advantage, because online ojek offers a fixed fare rate for your journey and also provides other significant advantages (Budiari, 2015). In 2017 online ojek is widely accepted, but a moderate opposition still remains from people involved in the traditional ojek market.

4.3 Online ojek

It is impossible to imagine the streets of Jabodetabek without the army of online ojeks. The popularity of the service and its legal setting causing on-going public and political debates are explained in detail in this subchapter.

4.3.1 A new trending mode of transportation

The overwhelming advantages of online ojek with regard to any other mode of transportation in Jabodetabek are the key of its success. In terms of outstanding aspects concerning flexibility, accessibility, travel time, price and reliability, the online service competes other modes. The competitive position triggers a shift from other modes towards the ride-hailing services. The Go-Jek app has been downloaded 40 million times up to April 2017 (Ojek, 2017). Online ojek service operators charge the customer Rp1,500 to Rp2,500 per kilometre in Jakarta, depending on the time of day. The online apps offer more than personal transport; parcels can be transported, services or products such as a cleaner, massage, food, groceries, medication etc. are amongst the things you can order from the apps.

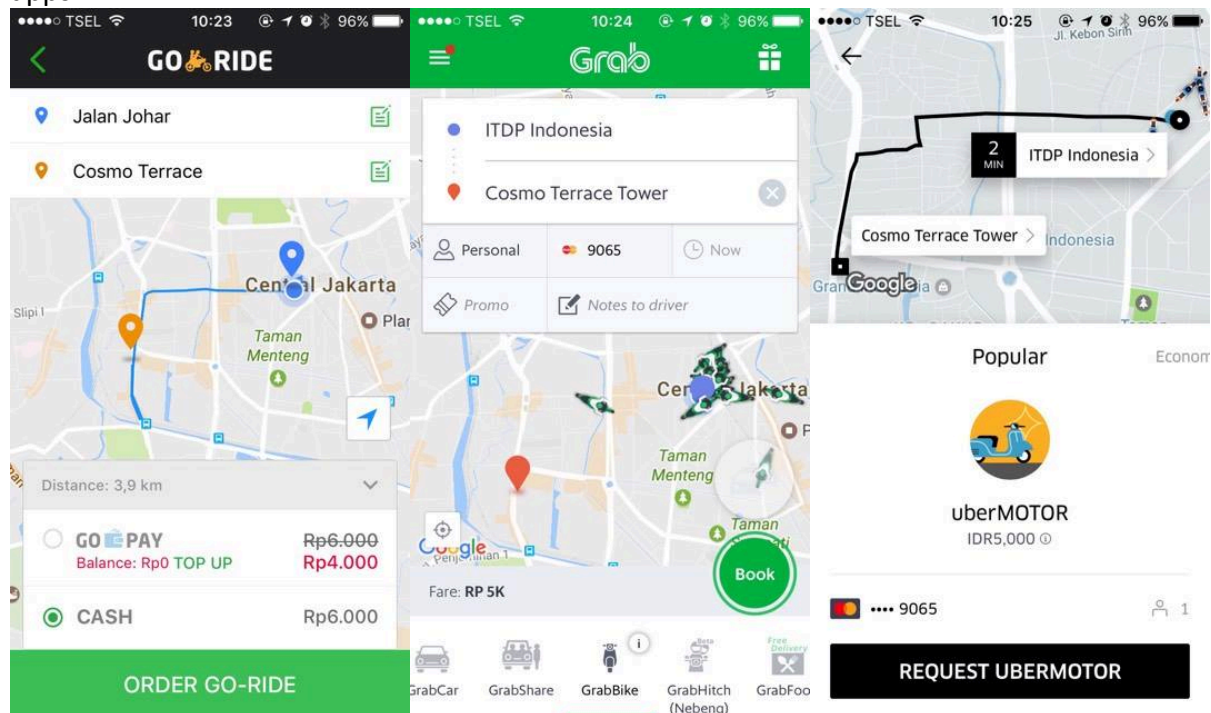


Figure 15 Online ojek applications, Source: Go-Jek, 2017, Grab, 2017, Uber, 2017

For online ojek drivers it is easy to register and depending on the service you drive for (Go-Jek, GrabBike or UberMotor) it might be possible to even combine a fulltime job with a part-time ojek driver position without weekly or daily user targets that have to be met.

The number of motorcycle and motorcycle taxis has grown rapidly from the year it was introduced in 2010. It is claimed to be the self-evident reaction on the neglected public transport systems and deteriorated congestion levels (Darmaningtyas, 2015). Indonesian Consumer Foundation (YLKI) chairman Tulus Abadi adds “The Indonesian law allows public transit under the condition that the mode has a minimum of three wheels; this is contrast with the political acceptance since the usage of the taxis” (Abadi, 2015).

Transportation observer Darmaningtyas believes so-called Ojek taxis should be initially banned where high-quality public transport is in place. Subsequently, he states that the prohibited areas for motorcycles should be gradually expanded in line with transport developments, which activate larger areas being served by high-frequency public transportation (Darmaningtyas, 2015) .

According to Mr Sunarya the main reasons for people to use ojek are because it is easy and cheap. He also says that being on the back of an ojek for longer than 30 minutes is considered exhausting. For Mr Sunarya’s daily commute pattern it is about 70% cheaper to use ojek than a car (Sunarya, 2017).

The fare of online ojek is relatively low in comparison to traditional ojek. Therefore, the wage of smart ojek drivers is not high, and it does not immediately stimulate regular motorcycle maintenance check-ups, which costs them extra money and leaves them with even less wage. Policy is being written on regulating a minimum number of maintenance checks per fixed time frame.



Figure 16 Online ojek with two passengers

Not only the irregular maintenance checks, but also numerous other safety issues make online ojek often a controversial means of transport. Driving through red light, riding on the wrong side of the road and a helmet for passengers that cannot be strapped, are among the many safety weaknesses. The picture on the right shows a toddler sitting behind the ojek driver, who is not wearing a helmet.

4.3.2 Legal setting

The legal structure of ojek is controversial with many supporting the service as part of the open market, but many oppose the adverse side issues, such as the unsafety of ojek, its environmental impact, illegal status and suffering of competitive modes of transportation.

According to Mr. Arouffy the definition of public transport needs to be revised as at the moment ojek falls under non-route public transport services. This is because ojek meets two requirements, which are you have to pay for the service and everyone can use it, but actually ojek should not fall under formal public transport according to Mr Arouffy.

Ms Nugrahaini believes that within the coming years the Indonesian government will not regulate online and conventional ojek. There is no sign from the government that they are considering revising the law for the short-term, despite law No.22/2009, which excluded two-wheeler vehicles as legal public transport mode. Contrariwise, according to Indonesia's legal construction commercial activities are envisioned as legal as long as these are not prohibited. Recent large sums of investments in the online ojek market show the confidence the private market has in online ojek remaining a legislative accepted mode of transport.

The current president Joko Widodo does not agree with banning ojek. Ms Nugrahaini adds: "all traffic problems are caused by the lack of qualitative public transport". That is why, at first, public transport needs to improve before ojek can be banned from the roads.

4.4 Conclusion

Online ojek originates from the bicycle taxi. The bicycle taxi in Jakarta converted into a motorcycle taxi to serve longer distances. This type of informal public transport was followed up by the online ride-hailing service called online ojek in 2014. The safety of online ojek is often discussed due to drivers that do not follow up road traffic rules, maintenance procedures and do not meet equipment standards.

Nevertheless, online ojek became popular instantly at the expense of the traditional ojek market. Conventional ojek lost part of their customers, and wages decreased. The persuasive factors to start utilising this new mode were the ease of use and a fixed fare per kilometre, and therefore not having to bargain about the price. Mostly, the tariff is also cheaper when using online ojek. Opposition of traditional ojek drivers is less existent than in 2014 and 2015 during which incidents between drivers from both modes were happening on a regular basis.

For online ojek drivers it is quite easy to register and start driving fulltime or part-time. Sometimes, no daily targets have to be met which incites people to drive online ojek whenever they have time, and they can use this as a secondary income to their normal job provided they have a driving licence.

The legal framework around online ojek is not waterproof. The law states that two-wheeled public transport is not permitted. Therefore, prohibiting the online ride-hailing service is a daily on-going discussion. Advocates of the service stress the importance of ojek as essential addition to current transportation in Jabodetabek, and the construction, which is in line with the open market principle. Transport experts suggest banning ojek only in districts where high-quality public transport is in place. In almost all cases no better public transport alternative can be offered at the moment. On the short-term online ojek seems to remain illegal but a publicly allowed as a formal mode of transport, which can continue to operate.

5. Insight into online ojek's user motivations

5.1 Introduction

In this chapter the structure and results of the interviews and brainstorming session are being discussed. During both types of qualitative research, themes are discussed and a combination of closed and open questions are asked. The outcome gives direction to the survey components, answers the research question and contributes to resolving the central research question.

5.2 Expert interviews online ojek users

The four expert interviews took place from March 15th until March 17th 2017. Each interviewee is a current online ojek user and also works in the transport industry. The respondents that were asked to partake are from two different transport organisations, but do not focus on online ojek during their working activities. Nonetheless, whilst they are working in the field, they are expected to have a strong opinion upon the interview topics. The interviewees are asked not to prepare anything, and beforehand only the topic of the interview was given, and not the content to prevent them from reading into the topic and being influenced by what they read.

The topics that are discussed during the interview are:

1. Travel behaviour
2. Travel behaviour before starting to use online ojek
3. Reasons to use online ojek
4. Travel costs (savings)
5. Travel time (saving)
6. Second and third preferred mode
7. Most important values of public transport
8. Room for improvement concerning public transport
9. Pull factors

The summary of each interviewed online ojek user can be viewed in Appendix VI.

5.3 Results

The respondents travel behaviour during the weekdays and in the weekend is discussed when utilising ojek and before the interviewees started to use ojek. Subsequently, the reasons to use and not to use ojek are questioned. In table 6 below the results are shown.

Three respondents use online ojek during their whole journey. In one case, ojek is used in combination with public transport and other on-demand transport. During the weekend another mode is favoured over ojek, such as taxi and car. Before the respondents started using ojek, they travelled by car, taxi and on foot. Time saving is the main reason amongst the respondents to use ojek. Costs savings is the second most common reason. A lack of comfortability, safety, storage space and costs savings, and when travelling with someone else, are reasons not to use online ojek.

Themes	Sub theme	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4
1. Travel behaviour	Week days	Ojek (Uber)	Morning: Taxi (Grab / Uber) Afternoon: ojek (Gojek)	Ojek (Grab/Uber)	Ojek (Gojek) - BRT - ojek (Gojek) / Bajaj
	Weekend	Car	Taxi (Grab / Uber) or ojek (Gojek)	Car	Go-Car and taxi (Uber)
2. Travel behaviour before starting to use ojek	Week days	Car	Taxi (Bluebird)	Car	Walking - BRT - walking / Bajaj
	Weekend	Car	Taxi (Bluebird)	Car	/
3. Reasons to use ojek	Reasons to use ojek	<ul style="list-style-type: none"> Time savings 	<ul style="list-style-type: none"> Costs savings Time savings Convenience 	<ul style="list-style-type: none"> Time savings Costs savings No parking space available at work 	<ul style="list-style-type: none"> Time savings
	Reasons not to use ojek	<ul style="list-style-type: none"> No costs savings Not comfortable Very exhausting "I like to drive a car" Not very safe 	<ul style="list-style-type: none"> Not comfortable 	<ul style="list-style-type: none"> No storage space When travelling with someone else 	/

Table 6. Interview results theme 1-3

Not every respondent saves money when utilising online ojek during the entire journey or part of the trip. It ranges from saving IDR 210,000 per week to spending IDR 90,000 more on travels when travelling by online ojek. As a reference, Jakarta's minimum wage is set on 3.35 million Rupiah since October 2016 (Elyda, 2016). Interviewee 1 adds: "There are no costs savings for me, but only time is saved when utilising online ojek, compared to using the car". Travel time is for all 4 ojek users saved, and it varies between 0 to 60 minutes per trip, depending on the distance to be covered. Half of the respondents travel longer distances to work than the other two respondents. Interviewee 4 states: "From 30 minutes it is not comfortable to use online ojek, thus if I have to travel longer than 30 minutes I would use another mode or a combination of different modes". Online ojek user 1 calls it exhausting to be one hour or longer on the back of an ojek.

Themes	Sub theme	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4
4. Travel costs (savings) per week	Ojek	IDR 250,000	IDR 90,000	IDR 50,000	IDR 175,000
	Other mode	IDR 200,000	IDR 300,000	IDR 150,000	IDR 85,000
	Savings	IDR -50,000	IDR 210,000	IDR 100,000	IDR 90,000
5. Travel time (savings) per trip on average	Ojek	60 minutes	10 minutes	15 minutes	60 minutes
	Other mode	Morning: 60 - 90 minutes Afternoon: 120 minutes	30 minutes	30 minutes	70 - 80 minutes
	Savings	0 - 60 minutes	20 minutes	15 minutes	10 - 20 minutes

Table 7 Interview results theme 4-5

Not in all cases the online-ride hailing service is stated as preferred mode. This is, because it is not always the cheapest mode, and in the morning peak there are sometimes different wishes in terms of comfortability when travelling as opposed to the afternoon. Only one time a type of on-route public transport, the train, is mentioned in the respondent's top 3. From this it can be concluded that on-demand transport services is highly favoured over public transport amongst the interviewees. Interviewee 1 gave the following explanation for this phenomenon: "Indonesians really think ease of use is important. It is the same at a restaurant: we will never clean up after eating in a restaurant, that is the waitresses' duty. The same goes for door-to-door journeys; it is the ease of use and laziness, which makes the choice for on-demand services, such as ojek easy".

Themes	Sub theme	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4
6. First, second and third preferred mode on week days	Morning peak	1. Car 2. Ojek (Uber)	1. Taxi (Grab / Uber) 2. Taxi (Bluebird) 3. Ojek (Gojek)	1. Ojek (Grab / Uber) 2. Car 3. Train	1. Ojek (Gojek) 2. Bajaj 3. Go-Car 4. Taxi (Uber)
	Afternoon peak	1. Car 2. Ojek (Uber)	1. Ojek (Gojek) 2. Taxi (Grab / Uber) 3. Taxi (Bluebird)	1. Ojek (Grab / Uber) 2. Car 3. Train	1. Ojek (Gojek) 2. Bajaj 3. Go-Car 4. Taxi (Uber)

Table 8 Interview results theme 6

Most importantly, values of public transport and room for improvement reveals the aspects of public transport that have to be further developed or improved. Reliability, accessibility to the station or bus stop, and coverage area are the most important values of public transport, similarly stated as factors for improvement amongst the interviewees.

Respondent 4 is sceptic about the accessibility: “For my wife the stairs to access the BRT are too high”. Also, at every station or stop a shelter for the rain is stated as a basic need.

Comfortability is not a highly stated value, as long as there is air conditioning and enough space to stand on the bus or train the respondents are satisfied. Respondent 3 illuminates: “Enough standing space is good enough on the train as well as on the bus; I don’t need a seating space”.

Themes	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4
7. Most important values of public transport	<ul style="list-style-type: none"> • Sidewalks • Reliability • Coverage area 	<ul style="list-style-type: none"> • Accessibility on foot • Reliability 	<ul style="list-style-type: none"> • Reliability • Convenience • Integration between different modes • Air conditioner • Enough place to stand 	<ul style="list-style-type: none"> • Comfortability • Price • Reliability
8. Room for improvement concerning public transport	<ul style="list-style-type: none"> • Accessibility • Coverage area • Reliability 	<ul style="list-style-type: none"> • Pedestrian infrastructure BRT (foot bridge) • Reliability - fixed schedule 	<ul style="list-style-type: none"> • Shelter for the rain 	<ul style="list-style-type: none"> • Shelter for the rain

Table 9 Interview results theme 7-8

Consequently, the interviewees are asked for possible successful pull strategies to boost public transport usage amongst online ojek customers. The entire analysis on push and pull factors to limit online ojek usage and stimulate public transport can be consulted in Appendix VII. “Grab advertises on the train by providing promo codes. This is a very smart strategy, because in this way the last mile to your destination after getting off the train can be covered with the discounted Grab ride”, interviewee 3 explains. Promo codes can also be provided in the ojek apps, which will give discount on your train or bus ride, in this way usage of public transport as part of the trip is promoted amongst ojek users. Interviewee 3 also suggests advertising on the reliability of public transport after improvements have been made, as it is a core value to start utilising public transport.

Respondent 2 stresses the importance of making public transport the quickest mode of transport. Next to that she suggests: “Bike share to cover the last mile has potential to become a competitive mode for ojek. Mode integration between public transport and the bike share system is therefore highly requisite. I would use it, because I heard about sexual harassment incidents, which occurred on ojeks. Interviewee 4 wants public transport operators to improve on comfortability, frequency and coverage area.

Themes	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4
9. Pull factors	/	<ul style="list-style-type: none"> • Make public transport the quickest alternative • Introduce a bike share system to cover short-distance trips 	<ul style="list-style-type: none"> • Improve the reliability and advertise on it 	<ul style="list-style-type: none"> • Improve comfortability • Higher frequency • Larger coverage area

Table 10 Interview results theme 9

5.4 Brainstorming session

Via acquaintances possible respondents were approached to see in which industry they work and if they meet the following requirements:

1. Utilising online ojek at least once a week
2. Possession of a decent level of speaking and writing in English

From the available respondents a selection has been made in order to form a group with individuals from a wide variety of industries.

On Wednesday the 29th of March from 5:00 PM till 6:30 PM the brainstorm event was organised amongst 6 employees from 5 different industries. For this brainstorm it is important to collect a wide variety of ideas, which is the reason why people from different backgrounds with a variety of perspectives are invited. A combination of individual information and opinions, and collective ideas and corresponding argumentations is key for this event. The parts of the brainstorm have each a different method, aim and set timeframe, which can be found in the table below. The methodology of the three phases survey 1 about travel behaviour, the brainstorming session about ideas on stimulating public transport usage and survey 2 about travel time, costs and improvement on public transport is explained. A more detailed description can be found in appendix IX.

Phase	Sub phase	Method	Aim	Duration in minutes
	1. Introduction	Presentation	Make the respondents acquainted with the other respondents and aim / importance of the event	5
Survey 1	2. Travel behaviour	Survey	Get a clearer picture on individual travel behaviour when using ojek	5
Brainstorming session	3. Ideas on stimulating public transport usage	Brainstorm	Generate new ideas that would make respondents more often use of public transport	10
	4. Summarise ideas	Verbal explanation	Making each team aware of the other team's ideas	5
	5. Ideas on stimulating public transport usage	Brainstorm	Review and improve the other group's ideas and generate new ideas	10
	6. Summarise ideas	Verbal explanation	Making each team aware of the other team's ideas	5
	7. Rank ideas	Group discussion	Rank the ideas based on the idea that will convince you to make more often use of public transport (1=idea that will convince you the most, 2=idea that will convince you secondly the most etc.)	2,5
	8. Rank ideas	Group discussion	Rank the ideas based on the idea that will convince you to make more often use of public transport (1=idea that will convince you the most, 2=idea that will convince you secondly the most etc.)	2,5
Survey 2	9. Travel time, costs & improvements on public transport	Survey	Define travel time and costs dynamics for ojek, BRT and KRL. Also, identify room for improvement on public transport.	10
	10. Closure	Presentation	Ask respondents for suggestions on online social media on which the final survey of the research can be published and thank respondents for contribution brainstorm	5

Table 11 Contents of the brainstorming session

5.4.1 Travel behaviour



Figure 17 Participants while filling out the survey

The first participant's contribution is a short questionnaire that had to be filled out individually with regards to the participant's travel behaviour. Most questions are related to their ojek usage. Also, their demographic information is asked. The respondents are asked to be as specific as possible when formulating their answers. The surveys about travel behaviour and improvements on public transport can both be viewed in appendix X.

5.4.2 Ideas on stimulating public transport usage

The method used for the brainstorm phases (phase 3-6) is called the Charette procedure. This procedure enables brainstorming on a certain topic in 2 or more teams. During the brainstorm it is mentioned that every idea is considered useful and there is no wrong idea (Designorate, n.d.). A PowerPoint presentation supports the information that has to be kept in mind while brainstorming and the tasks that have to be carried out. The slides of the presentation can be found in Appendix XI.

The 6 participants are divided into 2 groups with each group having a group leader and their own colour of markers. The team leader writes down the ideas on an A2 piece of paper. The participants are allowed to discuss in Bahasa but have to write down their ideas in English. Prior to the start of the first brainstorm session the topic, "What would make you use public transport more often?" is written down in the middle of the paper. The purpose is to create a mindmap of ideas (Designorate, n.d.).



Figure 18 Attendants while brainstorming

After the first phase both team leaders explain the ideas briefly to the other team so that the other group knows the definition and context of the ideas. Thereafter, the team leaders switch groups and take the A1 paper with them. Both groups will now contribute to the other group's ideas.

After the second brainstorming round the team leaders have time to clarify the changes that have been made and the new ideas that are added to the other group. Each team is asked to

define a top 5 of all ideas. Number 1 is considered as best idea to make more often use of public transport. The A1 papers are switched to the other group. The top 5 ideas are ranked again.

5.4.3 Travel time, costs & improvements on public transport

The survey is handed out to all respondents. Questions are asked about maximum travel time and costs for ojek, BRT and KRL. Subsequently, improvements before, during and after the trip are asked concerning the three modes.

5.5 Results

The full outcome of the brainstorming session can be consulted in Appendix XII. The results are divided over the three brainstorming phases: travel behaviour, ideas on stimulating public transport usage and travel time, costs & improvements on public transport.

5.5.1 Travel behaviour

The respondents are relatively young. One attendant is female and the other 5 are male. Half of the respondents live in DKI Jakarta, whereas the other half live in Depok. The purpose for travelling by online ojek differs per respondent from work, to shopping and social/recreational. Time saving, convenience and flexibility are the main reasons to use online ojek.

Name of respondent	Gender	Age	City of residence	Purpose of travel by online ojek	Reason to use online ojek
1. Apriyandi	Male	15-24	Depok	Work	Time
2. Astrid	Female	15-24	Depok	Shopping	Time
3. Ivan	Male	25-34	Jakarta	Work	Convenience
4. Mirza	Male	25-34	Depok	Social/recreational	Convenience
5. Qi	Male	25-34	Jakarta	Work	Time
6. Risandi	Male	15-24	Jakarta	Social/recreational	Flexibility

Table 12 Demographics, purpose and reason of using ojek

One to 6 trips a week are made by online ojek, thus the attendants do not use ojek daily to go to work. Other modes that are used in combination with online ojek trips are Bus Rapid Transit and train. Respondents started using ojek in 2014, 2015 and 2016. Before starting to utilize the popular mode, they used motorcycle, car, bicycle and mini bus. The perfect trip in the respondent's eyes does include public transport, preferably commuter trains, walking and cycling. Ojek is only mentioned once.

5.5.2 Ideas on stimulating public transport usage

The average score of both top 5 rankings is used to assess the brainstorm outcomes. Some ideas overlap with each other and are therefore combined. To give an example: "integrated ticketing" falls under "better public transport quality and facilities". Regulation on paratransit, conventional and online ojek is considered very relevant. Improving the public transport quality and facilities including higher capacities and real-time info on capacity, more transport units, integrated ticketing, ease of payment, comfortability, reliability, no-smoking policy and more trash bins is secondly most important. Thirdly, the respondents

state improvements on quality of bicycle and pedestrian infrastructure as relevant. Qi adds: “the main problem is the connection between BRT and KRL Commuter line, we don’t have the integrated infrastructure”. Ivan says: “the reason why I don’t use basic public transportation comes even before online ojek was introduced. Public transportation in Jakarta and the satellite cities around it is so bad, like the quality of the vehicles and accessibility: you have to walk far to access public transport. More stops, more vehicles and more capacity is necessary. Since the government doesn’t give clear rules and punishment specifications, organisations don’t follow the rules, all the issues are interconnected.” The complete overview on the brainstorm session is shown below.

Top 5 ideas	Paper team blue		
	Team blue	Team red	Average
1	Better public transport quality & facilities	Integrated ticketing	1. Regulation on paratransit, conventional and online ojek so that these meet the minimum service standard of public transport
2	Regulation on paratransit, conventional and online ojek so that these meet the minimum service standard of public transport	Regulation on paratransit, conventional and online ojek so that these meet the minimum service standard of public transport	2. Better public transport quality & facilities
3	Better quality of bike and pedestrian infrastructure	Better quality of bike and pedestrian infrastructure	3. Better quality of bike and pedestrian infrastructure
4	More transportation unites for more capacities	Better public transport quality & facilities	3. Integrated ticketing
5	Integrated ticketing	Education	5. More transportation unites for more capacities

Table 13 Brainstorm outcome team blue

Top 5 ideas	Paper team red		
	Team blue	Team red	Average
1	More routes and more transportation units	Changing the system of payment: E-money, Google wallet, monthly subscription	1. More routes and more transportation units
2	Clean & comfortable: no-smoking policy, more trash bins, limitation of capacity, real-time info on capacity, technology (apps)	Reliable	2. Reliable
3	Reliable	More routes and more transportation units	2. Changing the system of payment: E-money, Google wallet, monthly subscription
4	Changing the system of payment: E-money, Google wallet, monthly subscription	Clean & comfortable: no-smoking policy, more trash bins, limitation of capacity, real-time info on capacity, technology (apps)	4. Clean & comfortable: no-smoking policy, more trash bins, limitation of capacity, real-time info on capacity, technology (apps)
5	Affordable	Affordable	5. Affordable

Table 14 Brainstorm outcome team red

5.5.3 Travel time, costs & improvements on public transport

In the first part of survey 2 the willingness of spending money and time on ojek, BRT and KRL is assessed. The average maximum in-vehicle time over all respondents is similar for all three modes with approximately 47 minutes. The average maximum fare the respondents are willing to pay for ojek is 3.8 times higher than the maximum KRL fare and 4.4 times higher than for BRT. However the difference is in relation with current price levels, where ojek is more expensive than BRT and KRL.

Name of respondent	Ojek trip		BRT trip		KRL trip	
	Max. travel time in minutes	Max. fare in IDR	Max. travel time in minutes	Max. ticket price in IDR	Max. travel time in minutes	Max. ticket price in IDR
1. Apriyandi	20	15,000	60	3,500	60	4,000
2. Astrid	30	50,000	15	10,000	15	10,000
3. Ivan	120	50,000	60	10,000	60	10,000
4. Mirza	60	25,000	60	5,000	60	5,000
5. Qi	30	15,000	30	5,000	40	10,000
6. Risandi	20	10,000	60	3,500	45	4,000
Total	280	165,000	285	37,000	280	43,000
Average	47	27,500	48	6,200	47	7,200

Table 15 Willingness of spending money and time on ojek, BRT and KRL

Points for improvements before, during and after the journey by Bus Rapid Transit and commuter trains are asked from the respondents. The results can be seen in the chart below. The answers are divided over 12 categories. Accessibility concerns non-motorized access. Connection is the quality of interchanges. Facilities include shelters, vending machines etc. Information is mentioned in relation to time and capacity. With safety the security in the bus and at the station is meant. Vehicle quality contains comfort, air conditioner etc.

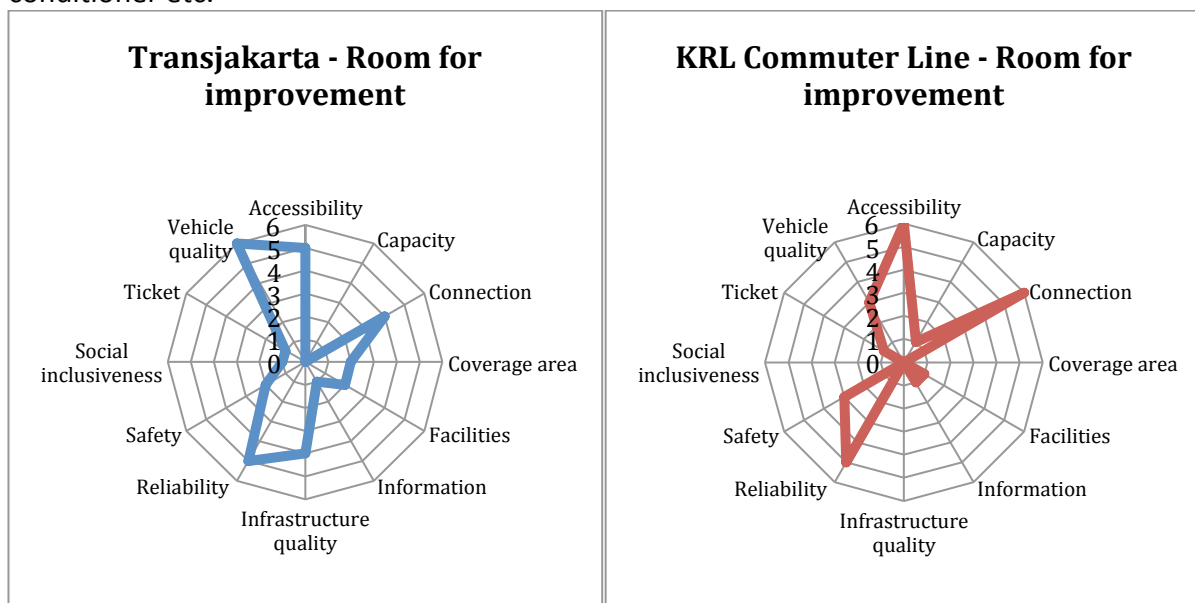


Figure 19 Room for improvement on Transjakarta and KRL Commuter Line

The shape of the radar chart of BRT is quite similar to the one of KRL. However, vehicle quality and infrastructure quality are more often mentioned for BRT than for KRL. For both modes accessibility, reliability, connection and vehicle quality are most common points for improvements.

5.6 Conclusion

The number of people using online ojek occasionally (1-4 trips a week) is higher than the frequent users (5 trips or more per week). Travel time saving, convenience and flexibility are the major reason to use online ojek according to the interviewed ojek users and brainstorm

attendants. Reasons not to use online ojek are: a lack of safety, storage space, comfortability and costs savings, and when travelling with somebody else.

The interviewees state when using online ojek up to 66.6% travel time can be saved in comparison to a taxi. The respondents do not feel comfortable and safe to use ojek for longer distance trips of more than 30 minutes. According to the majority of the interviewed online ojek users, public transport is not their first, second or third preferred mode. The perfect trip in an ideal world according to most respondents includes preferably KRL Commuter Line, walking and cycling.

Travel costs are not always saved by using online ojek: for longer trips of 60 minutes, costs are relatively higher than private car or public transport, and it can add up to IDR 90,000 costs per week more. For shorter distance trips online ojek usage is more favourable as it can save IDR 210,000 per week. The average maximum fare the respondents are willing to pay for ojek is 3.8 times higher than the maximum ticket price for KRL and 4.4 times higher than for BRT. The difference is in line with the current price levels.

Reliability, accessibility to the station or bus stop, transferability, vehicle quality and coverage area are the most important factors for improvement for public transport. Suggestions to boost public transport's user rates are: make public transport the quickest alternative, improve its reliability and advertise on it, increase the frequency, and improve on comfortability and coverage area.

From the brainstorm the top 3 ideas on stimulating public transport usage are:

1. Regulation on paratransit, conventional and online ojek
2. Improving the public transport quality and facilities: higher capacities and real-time info on capacity, more transport units, integrated ticketing, ease of payment, comfortability, reliability, no-smoking policy and more trash bins
3. Improvements on the quality of bike and pedestrian infrastructure

Respondents add to the ideas that KRL and BRT need to be better integrated with each other. Furthermore, accessibility to stops and stations, more stops to increase the coverage area and quality of vehicles needs to be improved. An underlying cause for inefficient single mode transportation and failing mode integration is the underperforming law enforcement.

6. Online ojek's user profile specification

6.1 Introduction

The previously carried out qualitative research functions as a backbone to compose a survey consisting of questions that are in line with the central research question. The online survey lets respondents effortlessly choose and clarify their travel behaviour, motives and corresponding choices. The analysis on the outcome provides quantified information closely related to the research objective, which serves as the main input for the conclusion of this report. This chapter consists of the subchapters online survey research, results, and conclusion.

6.2 Online survey research

After the first draft of the survey has been finalised, a pilot survey session was conducted in Thamrin City mall on the 21st of April 2017. Multiple respondents were asked to fill out the



Figure 20 Pilot survey, Source: Ms van Nieuwkastele, 2017

survey; subsequently the interviewed person was asked to explain how he or she interpreted each question. Some questions are misinterpreted and need to be revised for example. Concerning the multiple-choice questions about the aspects of online ojek and public transport, some new answers mentioned by the respondents were added to the answer options.

All questions are closely related to the research objective. The first part aims to exclude respondents from the survey that do not fall within the target group. In the introduction the purpose of the survey is explained and in bold it is stated that online ojek drivers should not participate in this research.

Various social media channels were used to distribute the survey. The surveys were shared through colleagues and friends mostly via social media. The picture to the right was shared on social media in order to gain attention for the survey.



Figure 21 Picture for social media, Source: M. Gituri, 2017

Next to that, an urban transport discussion was organised by ITDP on May 4th 2017, during this the survey was handed out as hardcopy to the attendants. Some questions have an answer from all respondents, 548 in total, and some will have less answers ranging between 548 and 310 as minimum.

6.3 Results

Firstly, the representativeness of the online survey results is explained. Subsequently, the results are analysed through combining the knowledge gained from the previous research phases and the survey results. The analyses are subdivided into three phases:

1. Demographics, travel behaviour and preferences
2. Correlation between subpopulations
3. Correlation between variables

In appendix XV the frequency and cross tables can be found. Only the outcomes that are closely related to the research objective are shown in the following analysis.

6.3.1 Representativeness

About the relatively new population group, online ojek drivers in Jabodetabek, is not well known with regard to socio-demographic information and travel behaviour. The previously carried out master research by Mr Sunarya and street observations provide an indication on the representativeness of the survey's sample. The sample profile described in the master thesis report is used as a reference. Observations took place on the streets at Sudirman, a business district from 08:00 to 09:00 and from 17:00 to 18:00 on Tuesday 25th April 2017 and at Thamrin City, a residential and shopping district from 10:00 to 11:00 on Saturday 20th of May 2017. Merely estimation on age and gender was made during both days. The survey results are compared to the additional two sources, which can be found below.

Aspects	Survey bachelor thesis research	Survey master thesis research	Observations
Average age	28 years	28 years	30 years
Males per 100 females	133 males	/	150 males

Table 16 Testing the representativeness of the survey research

The table shows comparable values for age and gender, with a relatively young user group and a 60% majority of male users. Both aspects designate an increased probability on the representativeness of the survey sample with regard to the population. The number of foreigners is relatively high with 93 out of 548 respondents (17%), which choose English as preferred language, assuming that these are all foreign. However, answers on all questions from the Indonesian-speaking group were compared to the English speaking ones, and no significant differences became visible. That is why; the English respondents are not treated differently than the Indonesian responses.

6.3.2 Demographics, travel behaviour & preferences

In this subchapter the frequencies, related percentages and charts are provided for demographics, travel behaviour and preferences of online ojek and public transport. Age

and gender is shown in a cross table as well as the origins and destinations of commuters that travel by online ojek. For the variable “minimum and maximum travel time and travel distance by online ojek” is zoomed in on the people that use the mode of transport in combination with public transport. Lastly, women’s response on online ojek and public transport aspects concerning safety is further analysed as well in this subchapter.

Demographics

Question 19 & 20. What is your age and what is your gender?

310 out of the 548 total respondents indicated their gender and age. For the remaining 238 respondents the information is unknown. Slightly more men than woman answered the survey. Most respondents fall in the age groups of 15-24 and 25-34 years. The average age is 28 years, which is a relatively young user group.

Age	Male	Percentage	Female	Percentage	Total	Percentage
≤ 14	1	0%	0	0%	1	0%
15-24	57	18%	35	11%	92	30%
25-34	98	32%	82	26%	180	58%
35-44	17	5%	14	5%	31	10%
≥ 45	5	2%	1	0%	6	2%
Total	178	57%	132	43%	310	100%

Table 17 User profile respondents

Question 17. Where do you live?

The respondents come from all areas of Jabodetabek. The number of respondents living in Jakarta account for 59%, and the people from the suburban areas (Bogor, Depok, Tangerang and Bekasi) add up to 41% of 309 respondents. From Jakarta, South Jakarta or so-called Jakarta Selatan come most respondents with 23%.

Question 5. Where do you travel to most often by online ojek?

77% of the 449 respondents travel to Jakarta of which most travel towards Jakarta Selatan. This illustrates the movement of people towards DKI Jakarta, which is the centre of employment in Jabodetabek.

Assuming that commuters travel from the area where they live by online ojek, the origin/destination matrix for that group is composed. Most people travel to urban areas of Jabodetabek. Whereas, most commuters that use online ojek live in urban areas. Of the commuters from the suburbs, most of them travel towards the suburban areas.

Origin	Destination		
	Urban	Suburban	Total
Urban	105	1	106
Suburban	49	32	81
Total	154	33	187

Table 18 Origins and destinations of commuters

Question 18. Which vehicle(s) do you own or do you have at your disposal?

350 respondents answered the question about vehicle ownership. Of 198 people the answer on this question is unknown. About 40% own a car or has direct access to one. 40% have a motorcycle or have a motorcycle at their disposal. Only 7% have or have direct access to a bicycle, and 16% do not own a vehicle.

Travel behaviour

Question 12. Before you became an online ojek user, which mean(s) of transport did you use mostly?

The table shows that specifically Transjakarta, Angkot and KRL users before becoming an online ojek user adopted online ojek as a new mode of transport. Secondly, respondents that mostly used the private car and motorcycle before the emergence of online ojek, are also large groups that became online ojek users. Overall, 20% of all responses mostly used on-demand transport, 58% public transport and 22% used their own vehicle mostly. Accordingly, the largest group of adopters are the public transport users before they started to use online ojek.

Mode usage before becoming an online ojek user	Frequency	Percentage
On-demand transport	172	20%
(Online) taxi	59	7%
Car share with family/friends	54	6%
Motorcycle share with family/friends	44	5%
Bajaj	15	2%
Public transport	496	58%
Transjakarta	139	16%
Angkot	137	16%
KRL Commuter Line	131	15%
Metromini/Kopaja	60	7%
Bus patas	23	3%
Shuttle bus	6	1%
Private transport	192	22%
Private motorcycle	98	11%
Private car	84	10%
Bicycle	10	1%
Total	860	100%

Table 19 Mode usage before using online ojek

Question 13. Which mean(s) of transport do you use every week at least once, besides online ojek?

From all responses 54% uses public transport at least once a week. In proportion to public transport, private transport and on-demand transport do not gain a large share of responses with 26% and 20% respectively. KRL Commuter Line and Transjakarta are most used modes of transport disregarding online ojek usage.

Question 3. What is your main purpose for travelling with online ojek?

The most common main purpose for travelling with online ojek is Work with 55%. Secondly, Friends with 12% and thirdly Education/course with 11% is selected out of 445 respondents.

Current mode usage besides online ojek	Frequency	Percentage
On-demand transport	122	20%
(Online) taxi	59	10%
Car share with family/friends	31	5%
Motorcycle share with family/friends	25	4%
Bajaj	7	1%
Public transport	337	54%
KRL Commuter Line	143	23%
Transjakarta	104	17%
Angkot	68	11%
Metromini/Kopaja	18	3%
Shuttle bus	3	0%
Bus patas	1	0%
Private transport	160	26%
Private car	78	13%
Private motorcycle	75	12%
Bicycle	7	1%
Total	619	100%

Table 20 Current mode usage

Question 4. What is the main reason you use online ojek?

The four main reasons for the respondents to use online ojek are: flexibility (order an ojek at any given time and it can pick you up and bring you anywhere), affordability (affordable fare), ease of use (easy to order and pay) and time saving (short waiting and travel time). Reliability (arrival and departure at the right destination) is by less respondents picked

(11%). Practicality, safety & security and remaining reasons account for 2% of the 449 respondents.

Question 8. Do you use online ojek mostly for the whole journey or part of the journey?

About one third uses online ojek from door to door and 69% of the 449 respondents use online ojek for a part of the journey. The people that use online ojek in combination with other modes during one journey are asked to specify these modes of transportation in the next question.

Question 10. Which mean(s) of transport do you usually use in combination with online ojek during one journey?

One third uses KRL Commuter Line in combination with online ojek. One fourth of the 224 responses uses Transjakarta. Proportionally the much higher overall capacity of commuter trains than BRT shows that relatively more people use Transjakarta in combination with online ojek. Angkot is used by 8%, Metromini/Kopaja, Shuttle bus/JR Connexion, and Bus patas is used by 7%, private car is chosen by 6%, car share with family/friends 6%, private motorcycle 5%, (Online) taxi 5% and Other 5%. With "Other" is meant motorcycle share with family / friends, Bajaj, bicycle and walking. Online ojek and public transport are used during the same journey by 50% of the respondents. Online ojek is complementary to public transport, as online ojek users utilise public transport and vice versa.

Question 2. How many one-way trips do you travel by online ojek per week?

The following question is about the frequency of online ojek on a weekly basis. If 0 one way trips a week is selected, the survey automatically ends for the respondent. The majority, 57% of 512 respondents uses online ojek occasionally with 1 to 4 trips a week, and 43% is a regular online ojek users with a minimum of 5 trips a week. The respondents, which make use of online ojek use online ojek at least once a week, they use the mode for 4.4 trips a week on average.

Question 9 & 11. What is the travel distance and time for a one-way journey by online ojek?

The average travel distance by online ojek is 8.5km from the 354 people that answered this question. Only 22% of 356 respondents travel more than 30 minutes by online ojek. With this in mind, a vast majority favour other modes of transportation over online ojek for journeys with duration of more than 30 minutes. Possibly a different mode for longer journeys is chosen, because the online ojek ride becomes less comfortable and safe when travelling longer distances according to the interview and brainstorm respondents.

The minimum and maximum travel time and travel distance by online ojek for the 229 online ojek users that use the mode of transport in combination with public transport is analysed. The sigmoid growth curve, also known as the s-shaped graph, shows an initial slow growth, then increases rapidly, but consequently the acceleration rate stabilises. From the moment the growth increases exponentially until the increase rate diminishes, the vast majority measures the most common travel time scale. For 76% of this group the minimum travel time is 9 minutes and the maximum is 31 minutes by online ojek.

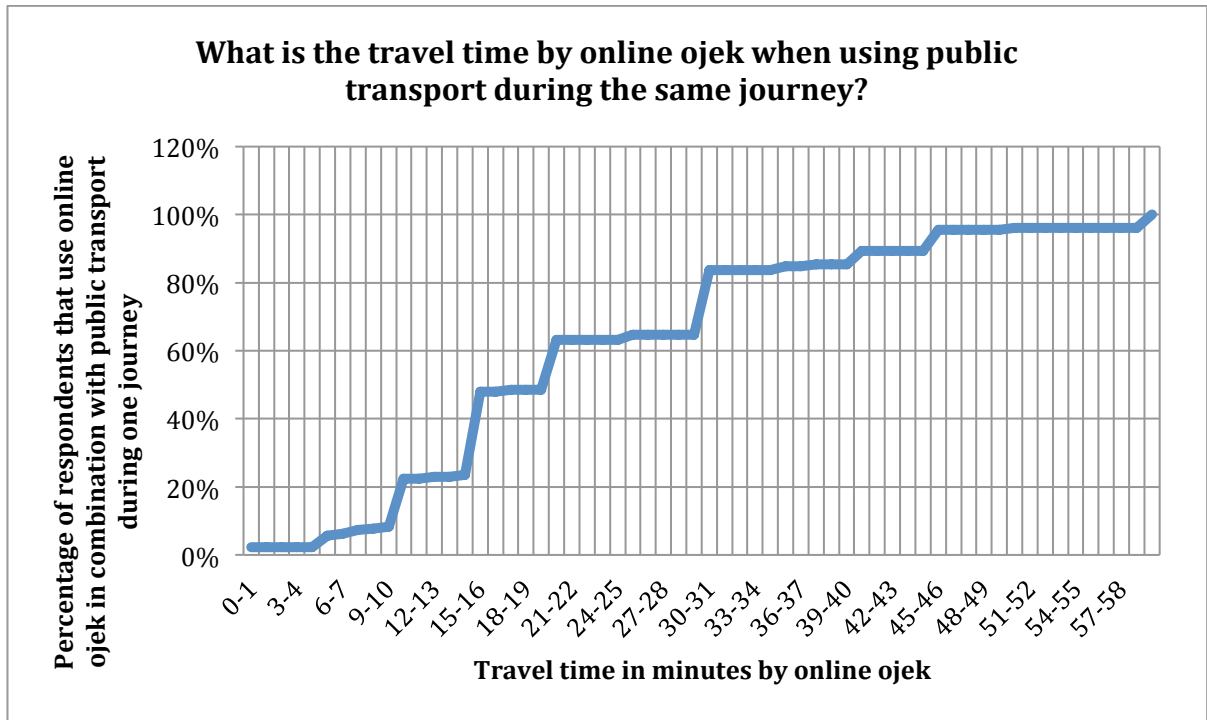


Figure 22 Travel time by online ojek when using public transport during the same journey

The sigmoid growth graph shows that 80% travel 2 to 11km by online ojek when travelling to public transport. 2 to 11 kilometres is the range around public transport hubs in which most part of trip user fall that use online ojek and public transport during one journey.

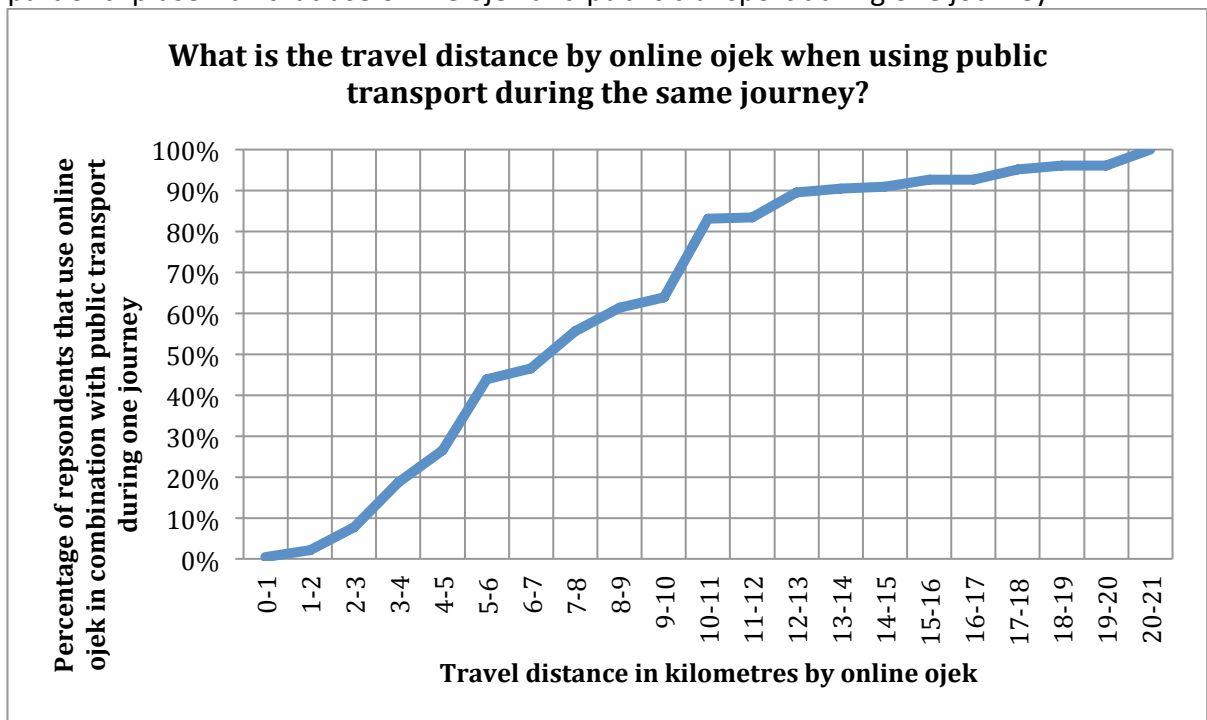


Figure 23 Travel distance by online ojek if using public transport during the same journey

Preferences

Question 6. What do you dislike most about travelling with online ojek?

The question “What do you dislike most about travelling with online ojek” is asked to the ojek users. 449 respondents select 1157 aspects. The aspects are ordered based on the chronological “customer journey” of online ojek. The most common negative aspects of online ojek are “Long waiting time”, “Driver cancels the trip”, “Bad navigation skills of the driver” and “Lack of safety when driving”. “Customer friendliness” and “No comfort during rain” are the common reasons for respondents to choose “Other”. Women care slightly more about safety when driving in relation to men. The response on that safety aspect is high.

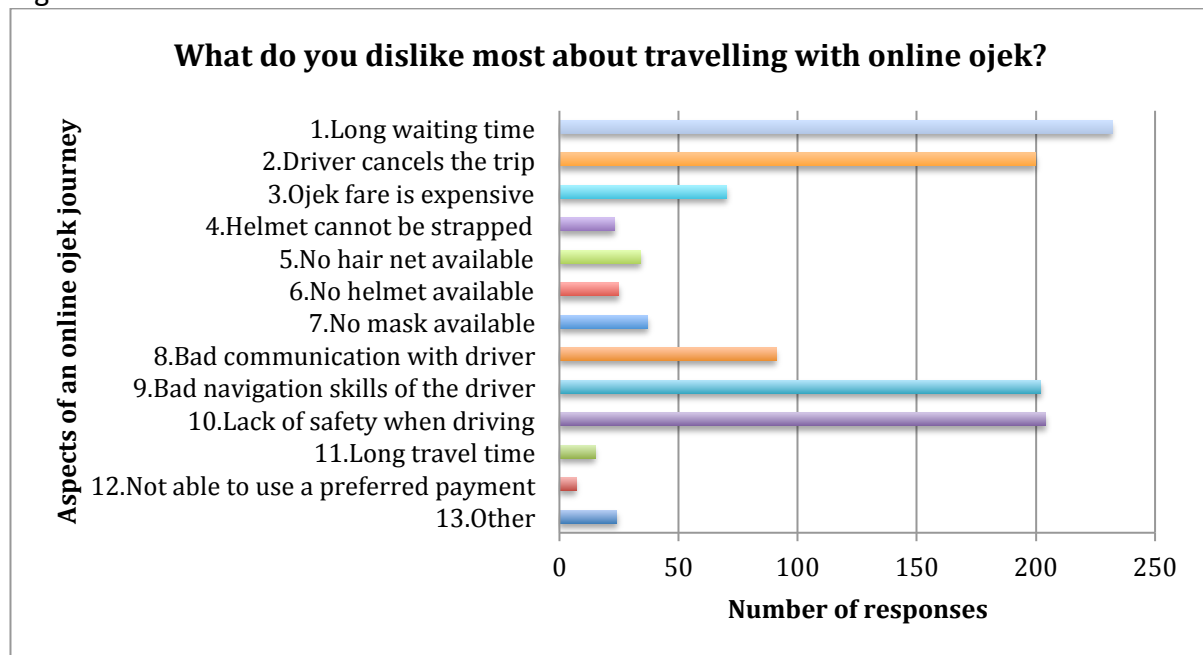


Figure 24 Negative aspects of an online ojek journey

Question 7. In case of heavy rain, will you still use online ojek?

This question was asked to 468 respondents in order to find out the change in seasonal behaviour this aspect causes. The reason to ask this question is because weather seems to play an important role in choice of mode, especially during Jakarta’s rainy season from October to May. From observations it was noticed that other modes are used when it rains, but also many people wait for the rain to stop. To get a better picture on the influence rain has on travel behaviour this question is asked. 55% of the respondents indicates he or she will wait for the heavy rain to stop and book a new online ojek trip after the heavy rain stops. 18% will use online taxi or conventional taxi, of which 12% will use online taxi and 6% conventional taxi. 13% will still order and use online ojek during heavy rain. The remaining respondents will use a different mode of transport. Some respondents indicate that the answer depends on the urgency of their journey. Only 32% changes mode of transport, which also indicates that rain does not fulfill a critical role in mode choice.

Question 16. Which aspects of public transport are important to you?

The last question is analysed to get a better viewpoint on the important aspects of public transport (bus and train) according to online ojek users. The aspects are ordered based on the “customer journey” of an individual utilising public transport. Based on the response of

312 online ojek users, the three most important factors are: 1. Distance to stop/station, 2. Ease to access stop/station and 11.Waiting time at stop/station. These aspects can be treated as prioritized room for improvement. Affordability, comfort, facilities and travel time is a bit less but still considered relevant. The pre-trip aspects receive about three times more response than in-vehicle aspects, which indicates the importance of pre-boarding on the way to the stop or station and at the interchange itself. The response by women and men are compared. Women class safety aspects towards the stop or station, at the station and in the vehicle are more important and relevant when compared to men.

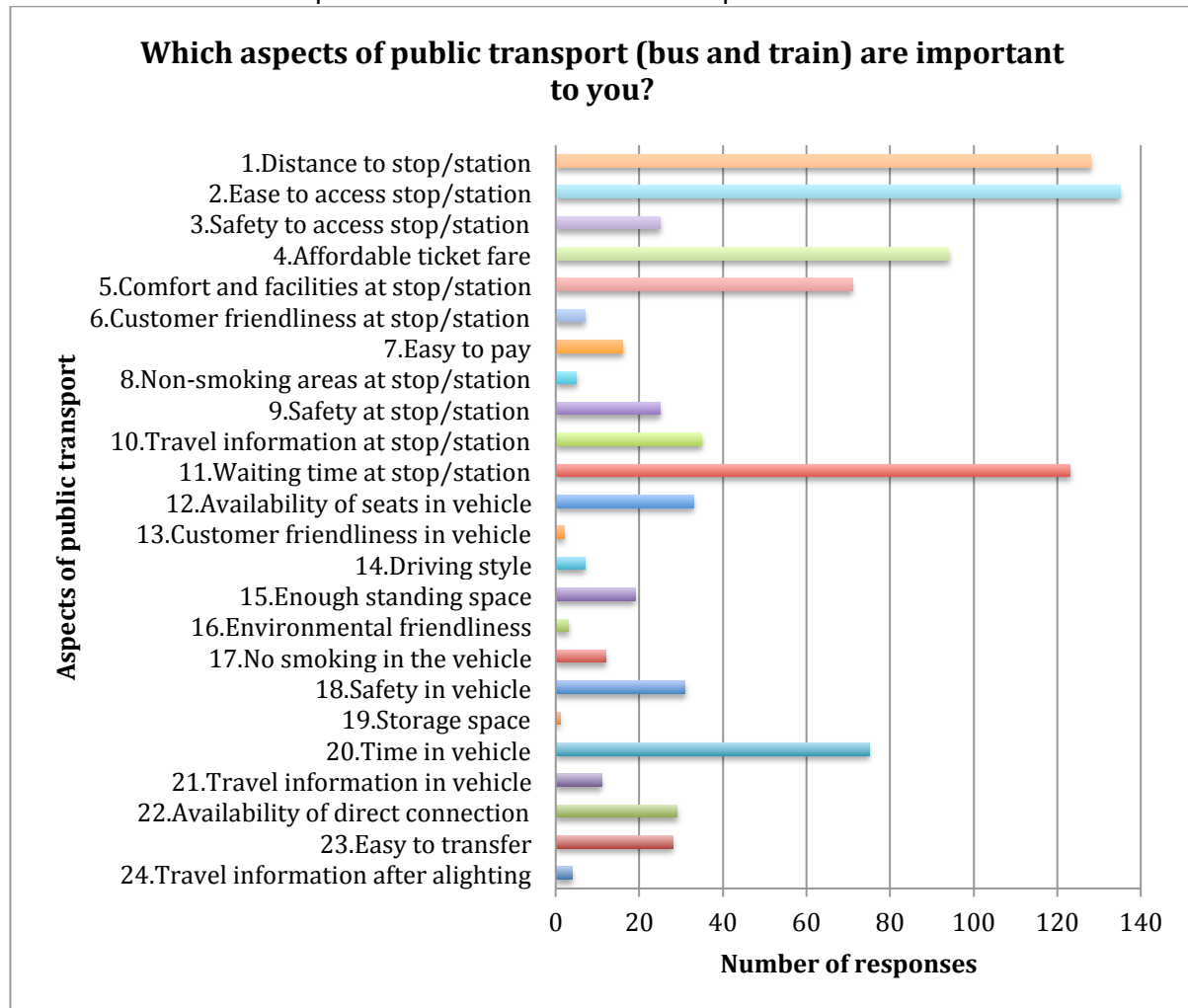


Figure 25 Aspects of a public transport journey

6.3.3 Correlation between subpopulations

For the analyses in order to identify different subpopulations multiple variables are compared with use of cross tables, two-tailed t-test and nonparametric method Kendall Tau.

The different subpopulations originate from the master research about the operational characteristics of online ojek carried out by Mr Sunarya and the expert interviews with him. These are explained for each of the three subpopulations below:

1. Female and male online ojek users in Jabodetabek, because from the interview with Mr Sunarya about public transport and online ojek respectively it can be derived that women’s safety is questioned, this could show significant differences between

gender on aspects of online ojek, aspects of public transport, reasons to use online ojek etc.

2. Online ojek users that live in urban areas and suburbs of Jabodetabek, which has been recommended by Mr Sunarya in order to identify variations between aspects of public transport as well as aspects of online ojek. Distance travelled and distance to rapid transit is expected to be different between people from the urban and suburban areas, but is not the main criteria to distinguish the subpopulation as significantly different.
3. Respondents that use online ojek for the whole journey and as part of the journey, it is suggested by Mr Sunarya to research the differences, because these can be large.

For each of the three methods (cross table, t-test and Kendall Tau) an example is given while considering the three subpopulations.

When a variable is compared to a subpopulation, each subpopulation sums up to 100% in order to easily recognize the variations. The cross table shows that sometimes a t-test or Pearson test is not necessary, because the differences do not seem significant enough to be in doubt about the existence of a correlation.

Reason to use online ojek	Urban	Suburban
Affordability	22%	23%
Ease of use	21%	21%
Flexibility	25%	25%
Reliability	11%	11%
Time savings	19%	19%
Other	1%	2%
Total	100%	100%

Table 21 Cross table example

The t-test results indicate that the p-value is greater than the significance level, which means the null hypothesis cannot be rejected. Therefore, it can be concluded that there are no significant differences between the variables.

T-test (two-tailed) variables	P-value	Significance level	Reject null hypothesis
1. Travel time/distance part/whole	0.066	0.05	No
2. Whole/part of journey			

Table 22 T-test example

Kendall tau is also used to test whether there are significant differences between nonparametric values. The example in the table shows no correlation between the two variables, because the correlation coefficient lies closer to 0 than 1, so there is a weak relationship.

Kendall's Tau variables	Correlation coefficient	Significance level	Relationship
1. Frequency of online ojek usage	0.130	0.05	No
2. Purpose of online ojek trips			

Table 23 Kendall Tau example

Besides the examples that are given above, more correlations between the subpopulations were sought. Nevertheless, no significant differences were found between the given subpopulations. Other subpopulations were analysed, such as making a distinction between occasional and frequent users, and people that own or have direct access to a car and the ones that have not. But no great variations between the user groups and the 19 other variables were found. From this, we conclude that based on the results, online ojek users in Jabodetabek is a homogenous group.

6.3.4 Correlation between variables

After no subpopulation could be distinguished, correlations between other variables were analysed. Next to cross tables, t-test, and Kendall Tau, a fourth method was used, called Pearson. The Pearson method tries to identify correlations between two different types of numerical samples.

This example compares the distance in km travelled by online ojek and age, because during the interviews with online ojek users it was stated that the longer you travel the more uncomfortable it becomes. This finding was interpreted as that age could have an influence on distance travelled.

Though, the null hypothesis is rejected, since the p-value is greater than the significance level.

Pearson variables	P-value	Significance level	Reject null hypothesis
1. Travel time/distance part/whole	0.860	0.05	No
2. Age			

Table 24 Pearson test example

The table below shows which variables are compared during the analyses process. The red colour shows that there are no significant differences; green shows there are significant variations between the variables.

Legend	
	Correlation
	No correlation
	Not analysed

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Language																				
2. Frequency online ojek usage																				
3. Purpose of online ojek trips																				
4. Reason to use online ojek																				
5. Travel to... by online ojek																				
6. Aspects online ojek																				
7. Mode choice during rain																				
8. Whole/part of journey																				
9. Travel time/distance part																				
10. Part of journey modes																				
11. Travel time/distance whole																				
12. Mode usage before ojek																				
13. Current mode usage																				
14. Rapid transit station/stop																				
15. Distance to rapid transit																				
16. Aspects public transport																				
17. Living environment																				
18. Vehicle ownership																				
19. Age																				
20. Gender																				

Figure 26 Correlations between variables

The identified correlations between 6 pairs of variables as shown in the table, are analysed in the following pages with titles indicating the variables that are compared with each other.

1. Frequency online ojek usage – Whole/part of journey

From all occasional users (1-4 online ojek trips per week), 76% uses online ojek as part of the journey. Whereas, frequent users take online ojek less often as a mode for part of the journey (61%).

Type of journey	Frequency of online ojek usage	
	Frequent user	Occasional user
Part of the journey	61%	76%
Whole journey	39%	24%
Total	100%	100%

Table 25 Frequency and type of journey

2. Living environment – Travel time/distance part & Travel time/distance whole

People living in suburbs travel on average longer distances for the whole journey by online ojek only and online ojek in combination with other modes of transport. On average they travel 6.4 kilometres more than people from the urban areas of Jabodetabek. In relation to this, the travel time is also higher for people from the suburbs with 8.4 minutes more travel

Travel distance whole journey with online ojek only and online ojek in combination with other modes of transport	Ojek users from urban Jabodetabek	Ojek users from the suburbs of Jabodetabek
Average travel distance in km	15,2	21,6
Average travel time in min	45,6	54

Table 26 Average travel distance and time

time than people from DKI Jakarta. 54 minutes is the average travel time for ojek users from the suburbs.

3. Whole/part of journey – Living environment – Distance to rapid transit

People Near Transit (PNT) is an indicator used by ITDP to measure the number of residents in a city that live in close proximity to rapid transit. Living within a 1-kilometre radius or 10 to 15 minutes walking distance from high-quality rapid transit is considered as respectable accessibility. From this, the idea derived to measure the accessibility to KRL Commuter Line and Transjakarta amongst online ojek users. Both formal public transport services form the main rapid transit network in Jabodetabek.

The distance in kilometres between the respondent's dwelling and the closest commuter line station or Bus Rapid Transit stop is asked. The graph shows the results range mostly from a 0 to 10km distance to rapid transit of the 318 respondents. More people living in urban areas have direct access, thus live within a 1-kilometre radius from public transit in comparison to people living in the suburbs, with 16% and 5% respectively. Only the urban PNT value is measured by ITDP in 2016, which is 44% over Jakarta's population, this value is considerably larger than the 16% of the online ojek users from DKI Jakarta (Institute for Transportation & Development Policy, 2016). This shows a relatively bad accessibility rate to rapid transit for online ojek users, which could also be the reason for them to use online ojek. The average distance to a rapid transit station or stop is 3.3 kilometres for ojek users that live in DKI Jakarta and 5.8 kilometres averagely in the suburbs. Within a radius of 3 kilometres from rapid transit, the frequent online ojek user lives closer to it than the occasional users. Especially whole journey users from urban areas live close to rapid transit, but nevertheless they do not use rapid transit in combination with online ojek. This might be because the distance to their destination is not too far and can easily be covered by online ojek. The respondents who live in close proximity to rapid transit might prefer to use online

ojek for the entire journey, because BRT stops and Transjakarta stations are often surrounded by main roads, which escalates the speed of online ojek for the whole journey without having to transfer.

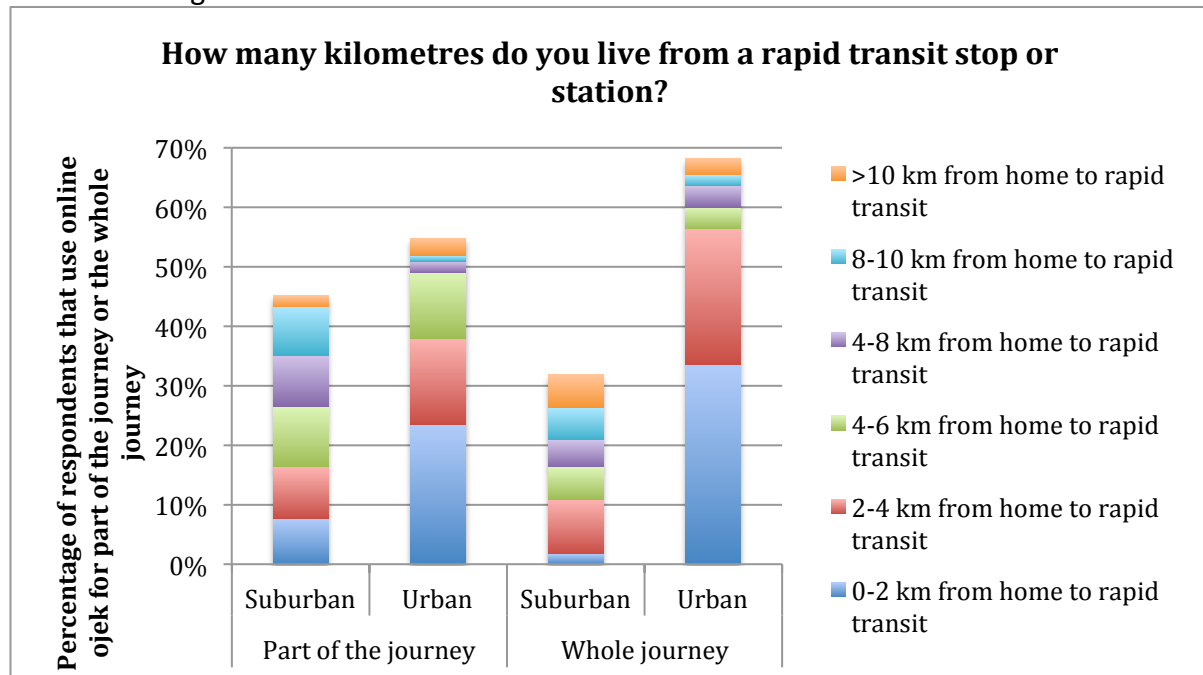


Figure 27 Distance from home to rapid transit among part of and whole journey users

6.4 Conclusion

For the predetermined three subpopulations no more than 1 set of variable with a correlation is identified. From this, we can conclude that online ojek users from Jabodetabek are a homogenous group. The user profile of the group can be described as follows.

Demographics:

1. The average age is 28, which is considerably young.
2. The number of male online ojek users is slightly larger than the number of female users.
3. The majority lives in Jakarta, and the minority is from the suburbs.
4. About 40% have a car at their disposal, 40% can use a motorcycle, 7% can use a bicycle and 16% do not own a vehicle or do not have direct access to a vehicle.

Travel behaviour:

1. The largest group that adopted online ojek was public transport users, before this they used to use public transport and an undetermined amount still use public transport.
2. 77% travel by online ojek to or within Jakarta. Most commuters that use online ojek travel within and towards the urban areas.
3. 55% travel by online ojek for work related activities. "Friends" is the second most common purpose with 12% and thirdly Education/course with 11% is common.
4. The four main reasons to use online ojek are: flexibility, affordability, ease of use and time saving.

5. 69% use online ojek for a part of the journey and the remaining share uses the mode for the whole journey. The people that use online ojek only for a part of the journey combine it in 73% of the cases with public transport. KRL Commuter Line and Transjakarta are the major contributors to this percentage, with 33% and 25% respectively.
6. On average 4.4 online ojek trips are made per week. The 57% that use online ojek 1 to 4 times a week are perceived as occasional users, whereas the other 43% are regular users with more than 5 trips a week.
7. An average online ojek trip is 8.5km long.
8. 22% travel more than 30 minutes by online ojek, which could suggest that this mode is uncomfortable and less safe for longer distance trips.
9. For 76% of the people utilising rapid transit in combination with online ojek during one journey the minimum travel time is 9 minutes and the maximum is 31 minutes.
10. The minimum and maximum travel distance for 80% of the same group is 2 to 11km to rapid transit.
11. 16% of the respondents from DKI Jakarta live within a 1km radius from rapid transit, contrary to 5% from people from the suburbs, which is significantly less than research amongst the whole population suggests. This could correspondingly be the reason why they use online ojek. Furthermore, the average distance to a rapid transit station or stop is 3.3km in Jakarta and 5.8km in suburban Jabodetabek.

Preferences:

1. Four aspects of an online ojek journey are disliked the most by the respondents: Long waiting time, Driver cancels the trip, Bad navigation skills of the driver and Lack of safety whilst driving.
2. 55% waits when it is raining and books a new online ojek after the rain stops, 13% will still use online ojek, and the remaining portion will use a different mode of transport.
3. The three most important aspects of public transport are: distance to stop/station, ease to access stop/station and waiting time at stop/station. These aspects serve as the main room for improvements. Affordability, comfort, facilities and travel time are second-class priorities. Pre-trip aspects are regarded as more important than in-vehicle factors and post-trip aspects.

When comparing different variables with each other, 5 different correlations became clear.

1. Occasional users travel more often with online ojek as part of the journey than frequent users.
2. The travel distance and time for the whole journey by online ojek and the total travel time by online ojek and other modes is higher for the people living in suburbs than in urban areas.
3. Travel time and distance by ojek to rapid transit for respondents living in the suburbs is higher than those of the citizens from Jakarta. Especially whole journey users from the urban areas live close to rapid transit.

7. Conclusion

Online ojek cannot be unnoticed on the streets of Jakarta. The online ride-hailing usage escalated the past few years. Nevertheless, the legal setting, safety, environmental and congestion related issues surrounding this new mode of transport have always been prevalent. Local authorities have not identified the characteristics of the user group, which is the initial step to be taken in order to provide recommendations on how to make them start using public transport more often.

From the survey results no significant variations between the three predetermined subpopulations are discovered. This feeds the perception of online ojek users in Jabodetabek being a homogenous population, which has the following characteristics based on the brainstorming session, expert interviews and survey research.

The largest share of current online ojek users come from the respondents that used to travel by public transport before they started to use online ojek. Online ojek has a relatively young user group being in their late '20's. 40% of the online ojek customers owns or can directly use a car and 40% have a motorcycle at their disposal. A large majority travels by online ojek to or within Jakarta. 55% commutes by online ojek. The four main reasons to use online ojek are: flexibility, affordability, ease of use and time saving. On average 4.4 trips a week are made by online ojek. Frequent online ojek users (more than 4 trips a week) use

Online ojek is mostly used for short-distance trips. For longer distance trips ojek is considered as unsafe, uncomfortable and expensive in comparison with other modes of transport. The majority uses online ojek for part of the journey, whereas the remaining share uses the mode for the whole journey. The fact that the on-demand service is used mostly for shorter distances and in combination with other modes indicates that it is a first and last mile transport service. On short distance, online ojek is commonly the fastest mode to get around in Jabodetabek. When the online ride-hailing service is used as part of the journey mostly it is combined with the usage of KRL Commuter Line and Transjakarta.

The average distance to a commuter train station or BRT stop is 3.3 kilometres in Jakarta and 5.8 kilometres in the suburbs. Living within a 1-km radius from rapid transit is regarded as walkable distance, thus good accessibility. Thus, generally online ojek users do not have good access to rapid transit, especially people from the suburbs. People from urban areas that use online ojek for the entire journey live closer to rapid transit, than part of trip users from Jakarta and all respondents from the suburbs.

The 3 most important aspects of public transport are: distance to stop/station, ease to access stop/station and waiting time at stop/station. Affordability, comfort, facilities and travel time are second-class priorities.

Guidance for public transport operators and local authorities are specified through analysing the research findings:

1. The attendants of the brainstorming session, which are online ojek users, described their perfect trip in their most ideal situation as one that would include

the KRL Commuter Line, walking and cycling. If this would be transformed into a design it would be a pedestrian and cyclist friendly environment around the train stations. Cycling and walking will cover the first and last mile, and the train will be for longer distance journeys. By the public transport operators and governmental bodies cycling and walking can be promoted as a healthy way of travelling, cost saving and the network can be improved upon safety aspects, accessibility to the station and availability of parking facilities.

2. 50% of all respondents utilises online ojek in combination with public transport, hence collaboration and coordination between both service providers is required to strive for an efficient hub-spoke network, where public transport covers longer distances and ojek for the first and last mile.
3. Three quarters of the respondents travelling to a public transport stop or station travel 9 to 31 minutes and for 80% of the same group travels 2 to 11km by online ojek. Public transport operators could use this length of time and radius around public transport nodes as guideline to set locations for promotion and advertisement for example.
4. 32% of the online ojek users prefer to use another mode during heavy rain. It can be recommended to offer free or discounted shuttle services to public transit at busy public spaces when it is raining, such as shopping malls and business districts, where crowds usually wait for the rain to stop.
5. Four aspects of an online ojek journey are disliked the most: Long waiting time, Driver cancels the trips, Bad navigation skills from the driver and Lack of safety whilst driving. Authorities can only influence "Long waiting time" by regulating the availability of ojek drivers. If travelling by online ojek would significantly deteriorate when the waiting time goes up due to regulating the number of drivers on the streets, a share of online ojek customers would prefer to use a different mode, which could be public transport.
6. Pre-trip characteristics are considered more important than in-vehicle and post-trip factors of public transit. Consequently, it can be recommended to put emphasis on the strategic approach containing pre-trip improvements and new developments concerning accessibility, transit stations and bus stops to aim for increased public transport ridership. Especially waiting time and accessibility are two main focus points. The waiting time at stops and stations can be improved through higher frequency rates of the public transport modes. Additionally, real-time information of all public transit modes shall be provided to the public so people can plan their trip more efficiently without the need to wait for a long time at the station.

8. Recommendations

This chapter elaborates on avenues of further research, limitations of the methodology and value of the report.

8.1 Recommendations

Recommendations are made in order to get more acquainted with online ojek's user profile and their motivations, and strategies in order to boost public transport ridership amongst online ojek customers. Avenues of further research are:

1. Calculate the environmental and economic impact of online ojek as being part of the large share of motorcycle traffic in Jabodetabek. This can be done in order to gain political and public support for continuous and vast developments to strive for an accessible, efficient, safe, affordable, sustainable and comfortable future for public transportation.
2. The assumable modal shift from public transport usage of 58% before, then becoming an online ojek user to 54% when starting to utilise online ojek needs further research. The results show a difference, but the outcome is not completely reliable due to the difference in question formulation where "most used modes" is asked for travel behaviour before starting to use online ojek and "modes of transport used at least once a week" is asked about current travel behaviour. However, the reduction indicates the possibility that the public transport market is mostly affected by the emergence of online ojek.
3. To determine the key locations that lack accessibility to rapid transit, more in-depth survey research with a larger sample size has to be conducted. In this way, the districts that are not served with sufficient public transport can be identified. After these are identified, planning and implementation activities for expanding the public transport network can be proposed.
4. 76% of online ojek users that use online ojek in combination with Transjakarta or commuter trains during one journey travel from 9 to 31 minutes, and 80% of the user group travel 2 to 11km. For KRL Commuter trains and Transjakarta buses it is useful, because they know now how far people are willing to travel to rapid transit. This could also suggest that people walk or cycle to the stop or station if the distance is less than 2km or 9 minutes by online ojek. Further research is required to determine how many kilometres and minute's people are willing to walk and cycle to rapid transit. Within that radius around rapid transit, the facilities and especially cycling and walking infrastructure can be improved.
5. To encourage a shift from online ojek to public transport, the 7 aspects for improvement that gained most response from online ojek users have to be taken into account. These are: distance to stop/station, ease to access stop/station, and waiting time at stop/station. Furthermore, affordability, travel time, and comfort and availability of facilities at stop/station are important. Case studies on public transportation and mode integration can demonstrate best practice examples from which Jakarta's authorities and private organisations can learn and implement. When conducting case study research, the previously mentioned aspects can serve as focus points.

8.2 Critical appraisal

This critical appraisal focuses on the limitation of the methodology throughout the research process and the value of the report for the key stakeholders of the report.

8.2.1 Limitations of the methodology

During the exploration phase it was hard to find specific recent information about Jabodetabek, such as the modal split and population size. In some cases less recent data had to be used, which might give a different view on the current situation. Secondly, as it is not possible to obtain the user data of online ojek users, this had to be researched further initially. In this way the attention on capturing ideas how to stimulate public transport usage is necessarily reduced. These resulted in outcomes being less specific on improvements and push and pull measures to stimulate public transport ridership. Next to that, my level of Indonesian (Bahasa) is poor, which is why the main language for the expert interviews and brainstorming session is English. By all means, this influences the type of attendants and therefore also the outcomes. The majority of Jabodetabek's citizens do not speak English, thus the outcomes might be less representative for the whole population.

More survey respondents could have been attracted if social media of public transport operators could be utilised to post the survey on. A greater sample size, would contribute to more accurate insights into online ojek users. Unfortunately, due to the core of the research about online ojek, it was considered that the research is not sufficiently related to public transport. Moreover, the government-owned public transport providers in Jakarta would rather remain neutral and do not want to appear as bodies rejecting online ojek, since the problem statement covers the adverse side effects of online ojek. Lastly, the 20 variables from the survey research do not show significant differences between subpopulations. This draws the conclusion to call online ojek users in Jabodetabek a homogenous group. But that is merely based on the analyses of the selected variables. It could be possible that subpopulations would have been found if other variables would be opted for.

8.2.2 Value of the report

The added value of this project for the stakeholders is as follows. First, the stakeholders obtain knowledge on the history, reasons for success and legal setting instabilities of online ojek in Jabodetabek. Second, user motives of online ojek users are unravelled in order to understand more about the underlying factors behind travel behaviour. Thirdly, the non-profit organisation gets an idea on the user profile of the online ojek customers including demographics and travel behaviour. Fourth, the validation on online ojek aspects according to the customer journey divided into the pre-trip, in-vehicle and post-trip stage provides insight into the values of the user group. Lastly, public transport aspects functions as starting point in order to define specific rooms for improvement on public transit. The recommendations for public transport operators and local authorities result from the four previously described research phases. The suggestions entail strategic approaches to increase public transport ridership amongst online ojek users in Jabodetabek.

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