

# OV-betalen for international travellers arriving at an airport in the Netherlands

Analysis report, March 2016

Expertise Centre for E-ticketing in Public Transport

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Industrial Design Engineering





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Analysis report  
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Delft University of Technology

This report is part of the Expertise Centre for E-Ticketing in Public Transport

March 2016

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Connexxion (bus transport operator to and from Schiphol airport and Amsterdam's surroundings)

GVB (Gemeentelijk Vervoerbedrijf, Amsterdam's municipal transport operator)

KLM (Koninklijke Luchtvaart Maatschappij N.V., in English Royal Dutch Airlines, the largest Dutch carrier airline)

NS (Nederlandse Spoorwegen, in English Dutch Railways, which is the primary Dutch rail transport operator)

RET (Rotterdamse Elektrische Tram, Rotterdam's municipal transport operator)

Schiphol Group (which operates Schiphol airport and Rotterdam - The Hague airport)

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## List of Abbreviations

AVM	Add-value Machine
DOT	Din Offentlige Transport (Danish), in English <i>Your Public Transport</i>
EMV	Europay, MasterCard, and Visa - global standard for credit and debit payment cards based on chip card technology, named from the card schemes that originally developed it
GVV	Gemeentelijk Vervoerbedrijf (Dutch), in English <i>Municipal Transport Company</i> (in Amsterdam)
IenM	Infrastructuur & Milieu, in English <i>Ministry of Infrastructure and Environment</i>
KLM	Koninklijke Luchtvaart Maatschappij N.V. (Dutch), in English <i>Royal Dutch Airlines</i>
MTRCL	Mass Transit Railway Corporation Limited (in Hong Kong)
NBTC	Netherlands Board of Tourism & Conventions
NS	Nederlandse Spoorwegen (Dutch), in English <i>Dutch Railways</i>
OV	Openbaar Vervoer (Dutch), in English <i>public transportation</i>
PSS	Product service system
PTO	Public Transportation Operator
RET	Rotterdamse Elektrische Tram (Dutch), in English <i>Rotterdam's Electric Tram</i>
TfL	Transport for London (Transportation system in Greater London)
TLS	Trans Link Systems
TVM	Ticket vending machine
WOM	Word of mouth

## List of Definitions

**Check-in & Check-out:** When travellers validate their electronic payment card when entering (check-in) or exiting (check-out) the public transportations system, either on gates at stations or validation poles at stations or vehicles.

**Concession:** A concession as defined by the Oxford Dictionary is: "A thing that is granted, especially in response to demands." Or "The right to use land or other property for a specified purpose, granted by a government, company, or other controlling body." (Oxford dictionaries: concession, n.d.)

**Customer Journey (Map):** "The customer journey map is an oriented graph that describes the journey of a user by representing the different touchpoints that characterize his interaction with the service." (servicedesigntools.org, n.d.)

**Feedforward:** Feedforward is understood as the opposite of feedback: when the users receive information or cues that explain or hint what actions are coming next or on how to continue. (Norman, 2013, p.72)

**Interaction:** "Bi-directional information exchange between users and equipment." (Source: ISO 9241-210:2010)

**Journey & Trip:** In this report a journey refers to the whole activity of travelling from A to B, while a trip refers to a segment within the journey. Thus, a journey can consist of multiple trips. For example, when going from Schiphol airport to Waterlooplein metro station in Amsterdam, the journey is Schiphol Airport to Waterlooplein and the trips within the journey are from Schiphol to Amsterdam Centraal (trip 1) and from Amsterdam Centraal to Waterlooplein (trip 2).

**Meaningful interaction:** The concept of "Meaningful Interactions" (MI) describe the reactions and emotions triggered through objects, they rationalize the relationship between people, products and contexts. These are relevant for the design field as MI provide theoretical rationalization on design studies and processes. (Gomes de Madeiros, 2014)

**OV-betalen:** Multiple forms of OV-chipcards exist and the sum of these ways of payment for public transportation in the Netherlands is labeled "OV-betalen". OV-betalen translated into English means *public transportation payment*.

**OV-chipkaart/OV-chipcard:** A smartcard the size of a credit card that enables public transportation users in The Netherlands to travel on all modes of public transport. In this report the OV-chipkaart refers to the plastic electronic card itself, while OV-betalen includes different forms of public transportation tickets and their respective travel products, see next definition.

**Personas:** Personas are fictive characters that represent the users of a product-service system, they are developed using insights from the field research. In this report the personas exemplify different types of travellers (chapter 5). "The purpose of personas is to provide a reliable representation of the key audience segments for reference. The included questions and areas of discussion will help you construct a "picture" of the visitors to your site (product, service). "(usability.gov)

**Top-up:** Adding balance or loading money to the electronic public transportation payment card.

**Touchpoint:** "Every contact point between the customer and the service provider." (Stickdorn, 2011) E.g. ticket vending machine

**Travel product:** Electronic (season) tickets that can be loaded on an electronic public transportation payment card.

**Travellers/users:** In this report usually the terms *travellers* and *users* describe international travellers arriving at an airport in the Netherlands or to London, Hong Kong and Denmark (benchmark locations, see chapter 4). In some cases the word will refer to all sorts of travellers, however in most cases it refers to international travellers. These are also referred to as foreign travellers.

**Usability:** The "extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use." (Source: ISO 9241-210:2010)

**User Experience:** A "person's perceptions and responses that result from the use and/or anticipated use of a system, product or service." (Source: ISO 9241-210:2010)

# Executive Summary

## Project Introduction

The graduation project “OV-betalen for international travellers”, which is part of the Expertise Centre for E-Ticketing in Public Transport at TU Delft’s faculty of Industrial Design Engineering, proposes a design-oriented approach and design solutions to the current problems regarding the way international travellers who arrive to the Netherlands at an airport, use public transportation in the Netherlands. The focus of this project lies on ticket payment.

This report is the first part of a larger project, which consists of two main phases: a research phase and a design phase. This report (the first phase) presents the current situation of international travellers, arriving at an airport in the Netherlands and their usage of OV-betalen. The study is complemented by a benchmark study of similar systems in London, Hong Kong and Denmark. Ultimately, the research phase provides insight on what it means to purchase and use public transportation tickets in order to develop solutions in the design phase.

In this project the TU Delft cooperates with Connexxion (bus transport company to and from Schiphol), GVB (Amsterdam municipal transport), KLM (largest Dutch carrier airline), NS (the primary Dutch rail transport operator), RET (Rotterdam’s municipal transport) and Schiphol Group (operates Schiphol and Rotterdam-The Hague airport).

## Relevance

Purchasing public transportation tickets in the Netherlands is a hurdle due to OV-betalen, which refers to different varieties of electronic payment in public transportation in the Netherlands. International travellers, who are usually first time users of the system, do not know how to acquire an OV-chipkaart, what travel products to select and in general make more mistakes throughout their journey, because they do not have established routines like domestic travellers. This is a significant challenge to the Netherlands, as according to a study commissioned by NBTC Holland Marketing, “inbound tourism is a major growth industry within the Dutch economy”. In this study the third main complaint of visitors to the Netherlands is the user-friendliness of public transportation, and it is suggested to improve the smartcard and payment options for travellers.

## Results

In order to design for the current issues, that international travellers have with OV-betalen, it is essential to understand what it means to purchase public transportation tickets. A mainly qualitative research approach is used to gather data. Interviews are carried out with users and experts, observations are made in the field, first hand experience is noted and documents are studied, in order to get a complete picture of the situation for international travellers using public transportation in the Netherlands. Different travellers have different travel goals and interact with the public transportation system at different places and through different touchpoints (“contact points between the customer and the service provider”). The multiple aspects affecting usage and experience have been categorized into different factors:

### *Types of Travellers*

Four different types of international travellers have been identified after interviewing and observing travellers in the Netherlands, London, Hong Kong and Denmark.



- *Spontaneous travellers* usually use public transportation incidentally.
- *Efficient travellers* usually have a plan for their stay and select the best options in terms of tickets and activities or a combination of both.
- *Purpose travellers* have a specific destination and usually have to go to that destination and immediately travel back.
- *All-set travellers* usually are visiting friends and family, so they use public transportation, but are supplied with tickets and information by their hosts.

The variety of travellers shows that the different types of travellers have different needs, when it comes to usage of OV-betalen and public transportation. In order to improve the system all travellers' needs should be considered in order to address a larger range of users and provide a better service overall. For this study the traveller segmentation provides guidance to develop solutions for current problems either specifically for one group of travellers or holistically for all types of travellers.

#### *Travel Phases*

There are four travel phases (pre-public transportation experience, pre-travel experience, travel experience, post-travel experience) that consists of multiple steps travellers take when interacting with public transportation, see figure 00. Because travellers go through the steps using different touchpoints in different contexts, as multiple parties are responsible to provide the means to interact with public transportation in the different phases, there is no right or best way to use and the experience the system. The travel phases and steps show that purchasing a ticket actually cannot be treated as an individual action, but that the whole travel journey and experience of international travellers must be considered to create a seamless experience. In order to improve OV-betalen for international travelers, the diversity of use cases and the different combinations of touchpoints and locations should be incorporated into the solution.

#### *Touchpoint Problems in the Dutch public transportation system*

Ticket vending machines and validators belong to the groups of technology-based self-service and are touchpoints that frequently cause the traveller to have problems. Companies should provide alternative solutions to failure to smoothen the effect these failures have on travellers; in the case of the public transportation system travellers seek for help and advice from service personnel. Even though it is positive that personnel are available, it was found that often service personnel does not provide the appropriate guidance. This aspect has a large impact on the users' experience, because service failure is most likely to not be tolerated twice by the customers and results in a negative perception of the service providers. There is a large amount of information provided in regards to the Dutch public transportation system online. Also there are many sources of information at different contexts, however due to the large number of operators



Figure 00. Travel phases and steps

## Executive Summary

the information provided causes travellers to lose overview and not know what option is best. This lack of overview is experienced both on digital sources as well as at the different contexts of use. In some cases the information is only provided in Dutch and not in English, hence international travellers might be able to access the information but then fail to understand it.

### *Benchmark Comparison*

A comparison amongst the situations in the Netherlands, London, Hong Kong and Denmark has been made taking the Dutch system as the frame of reference. The insights provide guidance when developing solutions for current problems for international travellers' experience in the Dutch public transportation system.

### **General findings** (in two or more of the countries)

- Many travellers have the perception that using an electronic payment card is only relevant as a local but not as a tourist.
- Many travellers prefer to talk to service personnel rather than looking for information themselves.
- The usage of smartphones, especially of Google (Maps) is broad and perceived as very useful.

The most noticeable insights from the benchmark locations are:

### **The Netherlands**

- The Anonymous OV-chipkaart is not often bought by international travellers.
- Especial day tickets and touristic tickets are popular tickets amongst international travellers – the */ amsterdam* card is appreciated by tourists.
- International travellers have trouble not forgetting to check in and out at open payment borders.
- The terminology of ticket names is often not understood or misunderstood by international travellers.
- Service personnel is often available and located at relevant locations (e.g. tram booths in Amsterdam), however the personnel is from different operators. Hence, they are not trained to provide information about all companies.

### **London**

- The Oyster card is sold as the best option for international travellers.
- The money on the card can be refunded.
- Service personnel is almost always available.
- Information provision in the tube is appreciated by travellers due to it's detail.
- The amount paid for a trip is not necessarily clear as it depends on several factors (daily capping, zones, peak hours,...).

### **Hong Kong**

- Through information provision in all forms travellers feel guided through their whole journey, even if they are completely unfamiliar with the system.
- Information is always provided in English too.
- The Octopus card is not explicitly sold to international travellers, therefore international travellers do not necessarily purchase it.

- For a small fee the money on the card can be refunded.
- The connection between the airport and the city centre is perceived as extremely comfortable when using the Airport Express.

### Denmark

- The umbrella company DOT (Eng. Your Public Transportation) provides information about public transportation as one entity for all the different companies throughout multiple touchpoints.
- Rejsekort is not addressed to international travellers and a high fee must be paid (ca.80 Euros) to travel country-wide with it.
- There are especial day and touristic tickets in the Copenhagen area.
- Information is often only provided in Danish, making the understanding hard for international travellers.

### Conclusions: Recurring themes relevant to ticket purchase & usage

Themes that affect the purchase and usage of public transportation tickets are established. They are the most frequent (meaning that several users encountered them) and/or most impactful (meaning that they have a great impact on the travellers' experience). Additionally, they pose opportunities for improvement during the next phase of the project (design phase).



**Searching for information:** Travellers are constantly searching for information related to their journey. Knowing where to find the information, understanding the information provided and having an overview of the options available (in terms of transportation in general, operators, routes and tickets) can impact the way travellers' use of OV-betalen positively.



**Wayfinding:** Spatial orientation is a recurring factor affecting the seamlessness of travellers' journeys. A successful orientation allows for a more efficient travel experience, which is influenced by the clarity of signage and information provision. In several contexts, like at Schiphol airport, or during interchanges between modalities and/or operators, spatial orientation was problematic for travellers.



**Knowing what to do (next)** is a further factor affecting the way travellers' interact with the system. If they don't know what is expected from them to continue their journey, the journey is interrupted and therefore experienced as less seamless, which, for example, was encountered at open payment borders (where there are no gates).



**Payment:** Being able to pay in the OV-betalen system is a major issue at ticket vending machines. Frequently problems related to payment (not being able to purchase a ticket with a bank card or with paper money) at the ticket vending machines were encountered, these problems start off the experience of travellers with the public transportation system negatively.

# Amsterdam



Travellers entering Amsterdam Central Station

Currently international travellers arriving at an airport in the Netherlands do not experience seamless travel. The following quote is an example from the field that illustrates the situation of international travellers trying to purchase the proper public transportation ticket (a so called OV-chipkaart) at a ticket vending machine at the airport. They are not sure what ticket they should purchase, as they do not understand the terminology used for the ticket names.

Rotterdam airport, at public transportation ticket vending machines

**"A: We are thinking, is the price 15? But I haven't chosen this. Because I don't know what is this "OV-chipkaart". I don't know if we get the right one or if we need this. Maybe I should buy it?**

**B: We don't know what's the difference between purchase Anonymous or purchase Disposable OV-chipkaart.**

**A: Because I think we are Anonymous? We don't know what is chipkaart."**

– Couple, age: 20-30, Slovakia

The graduation project "OV-betalen for international travellers", which is part of the Expertise Centre for E-Ticketing in Public Transport at TU Delft's faculty of Industrial Design Engineering, proposes a design-oriented approach and design solutions to the current problems regarding the way international travellers who arrive to the Netherlands at an airport, use public transportation. The focus of this project lies on ticket payment. This report discusses the current ways international travellers experience OV-betalen when using the Dutch public transportation system and the results of a benchmark study of similar systems abroad (London, Hong Kong, Denmark).



## 01 - Introduction

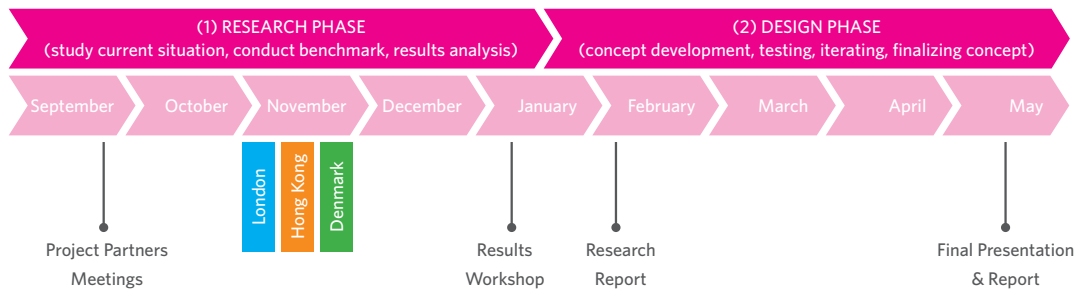


Figure 1. Project Timeline

### 1.1 Project Setup

This report is the first part of a larger project that consists of two main phases, a research phase and a design phase, as figure 1 shows.

- The first phase is to study the current situation of international travellers, arriving at an airport in the Netherlands and their usage of OV-betalen. This will be elaborated and visualized using a customer journey (definition p.8). The study is complemented by a benchmark study of similar systems in London, Hong Kong and Denmark.
- The second phase consists of designing solutions for the usability problems established in the first phase. These design proposals will be tested and iterated into concepts and ideas for both a short and long term development of the OV-system.

## 1.2 Relevance: OV-betalen for international travellers arriving at an airport

For international travellers OV-betalen, which refers to different varieties of electronic payment in public transportation in the Netherlands (defined in chapter 3.3.1), poses a challenge, as the travellers usually are unfamiliar with the workings of the Dutch public transport system: They do not know how to acquire an OV-chipkaart, what travel products to select and in general make more mistakes throughout their journey, because they do not have established routines like domestic travellers have. Research conducted in the OV-chipkaart Graduation lab found that the Dutch public transportation system can benefit frequent travellers, but that infrequent travellers - which international travellers are - have problems when acquiring an OV-chipkaart and the respective travel products. Frequent travellers are used to the system and have established routines to pay for public transportation, however infrequent travellers have not yet developed these practices for using the system, which results in usability problems, like forgetting to check in and out at validation gates and/or poles, which is necessary in order to pay the proper public transportation fare (Joppien, Niermeijer and Niks, 2013). Purchasing public transportation tickets in the Netherlands is a hurdle due to OV-betalen.

This is a significant challenge to the Netherlands as, according to a study commissioned by NBTC Holland Marketing (2015) "Inbound tourism is a major growth industry within the Dutch economy". International tourism to the Netherlands has increased by an approximate of 40 % from the year 2000 up to 2014. In this study the third main complaint of visitors to the Netherlands is the lacking user-friendliness of public transportation, and it is suggested to improve the smartcard and payment options for travellers. (NBTC Holland Marketing, 2015). Evidently there is room for improvement regarding the Dutch public transportation system when it comes to international users. Politically it is a relevant topic as in order to keep tourism in the Netherlands stable and growing, it is essential to use this significant opportunity and search for ways to improve the services related to public transportation for international travellers.

In this project the TU Delft cooperates with the following organizations, see figure 2: Connexxion (bus transport company to and from Schiphol), GVB (Amsterdam municipal transport), KLM (largest Dutch carrier airline), NS (the primary Dutch rail transport operator), RET (Rotterdam municipal transport) and Schiphol Group (operates Schiphol and Rotterdam-The Hague airport). These companies are direct project stakeholders that are dealing with the problems of international travellers and are referred to as project partners, considering that there are also other stakeholders, such as the Dutch government or commercial entities related to the topic of study. Figure 14, which is further elaborated in chapter 3.4.2, represents all stakeholders linked to international travellers arriving at an airport in the Netherlands and highlights to which category the project partners belong. Determining these is an important step to establish the context of the project in the first stage of the project.

## 01 - Introduction



Figure 2. Company logos of project partners

The role of the project partners is to support the research by providing a primary contact that can facilitate the access to company information relevant for the development of the project, like their expert opinion, previous research, pilots or further contacts. At the beginning of the project a meeting was arranged with each project partner separately with the purpose to acquire an understanding of the partners' ambition through the involvement with this project. In general the high level goal is to improve the current situation for international travellers when selecting, paying and using the public transport tickets for their stay in the Netherlands. The project partners are aware that each public transportation journey is perceived as a separate entity for the travellers and believe that by providing a travel flow amongst operators would smoothen the transition from air to ground and within the ground from location to location consequently improving the whole service and therefore the whole user experience. This would benefit public transportation as a whole and also each of the partners' businesses. However the partners all have different concerns regarding their own companies and are aware that the implementation of solutions comes with finical decisions that might be a decisive factor that decides whether the realization of solutions will take place or not. All partners have the willingness to improve, but the way to improve is not clear, hence this project will provide guidance to the businesses in terms of developing user-centred solutions. In appendix D an individual summary of the partners goals and concerns is available, as well as the function of the contacts per company. The following quotes illustrate goals and aims that the partners expressed in relation to the project.



**"... with the other companies we can make a better offer. So, if we, my vision is, if we strengthen the whole public transport as a whole if we can make it more like one network we can attract more customers to the public transport vehicles." - Connexxion**

**„If you look at our international travellers we actually have two issues that we would like to solve: The first one is getting them to buy tickets earlier and the second one is make sure they don't buy tickets in vehicles." - GVB**

**„I think the main interest from KLM specifically is, we want to offer the KLM passenger a very nice passenger journey, and it would be rather naïve, I would say, to state that if the passenger arrives at Schiphol and leaves the arrival hall that then KLM is sort of "That's it, we are not interested anymore."" - KLM**

**„Your "seamless experience" that is our goal; international travellers will get a seamless experience by travelling with public transportation in the Netherlands. It should be easy, that is the difference to "I am going to take the car"." - NS**

**„The goals are to reach (the international traveller) sooner and (for them) to see options, so that it's not so busy at the bus station and also in a national project with NS we are talking about tourists tickets, where the bus and metro are combined with the train." - RET**

**"So we try to be passenger friendly, take care of our guests, it's not passengers its guests and make it as seamless as possible. And in our mind, in our vision, it's the trip to and from the airport is also included in the total travel experience." - Schiphol Group**

## 01 - Introduction

### 1.3 Problem Statement

The current experiences that international travellers in the Netherlands have when using public transportation are not seamless. There are information communication problems throughout the public transportation touchpoints (definition p.9) of the different operators and the use processes are not self-explanatory making the usage of public transportation difficult, especially for international travellers, who are not familiar with the system and the contexts of use (country, airports, stations and stops etc.).

### 1.4 Project Goal

The goal of the project is to develop user-centred solutions to improve international travellers' experience when selecting, paying and using their public transport ticket(s) for their stay in the Netherlands. The solution space will be split into short- and long-term developments that might require different investment strategies and technological developments, like the introduction of new carriers such as mobile phones and EMV bank cards.

Considering the overall goal, the developed product-service-system solutions should not only consider the human aspect, but also the product-service-system's relevance for society, technology and business. (Van Kuijk, n.d.) Figure 3 illustrates the synergy created by these four elements. They establish the best product and service outcomes in a sense that studying the individual's needs and desires is a starting point that leads to consider several individuals and the impact it has on society and subsequently considers the technical feasibility and viability of these solutions for the businesses involved. (IDEO, 2009). A detailed description of each element can be found in appendix A.

The goal for stage one, this report, is to create an understanding of what causes the current problems international travellers have when interacting with the public transportation system, in order to be able to develop the user-centred solutions to improve international travellers' experience when using OV-betalen.

### 1.5 Vision & Mission

#### Vision

International travellers arriving at an airports in the Netherlands experience seamless travel from the moment they decide to travel to the Netherlands to the moment they travel back to their home country.

#### Mission

Improve the user experience of international travellers during their journey with the Dutch public transportation system by developing user-centred solutions for the relevant touchpoint problems they encounter, with the goal to provide travellers with a seamless travel experience.

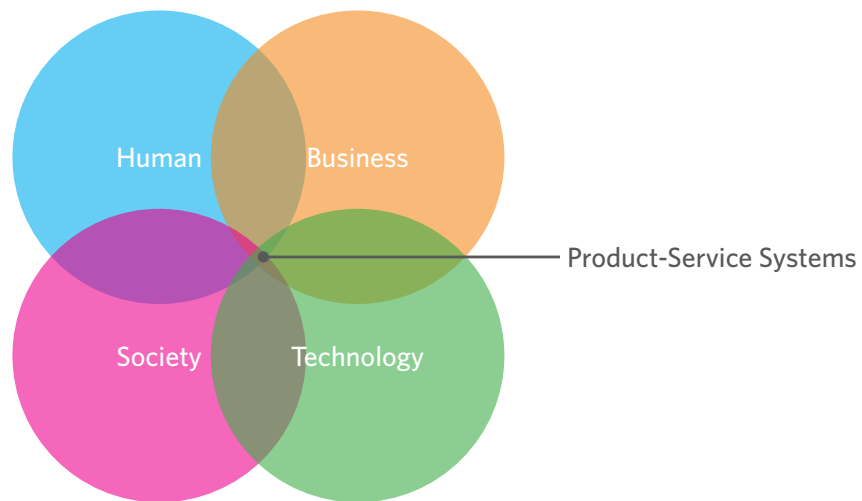


Figure 3. Social innovation model by Van Kuijk adapted from the Human-centred design model by IDEO (2009)

## 1.6 Method: Research Phase

### 1.6.1 Aim

Within the research phase the aim is to identify opportunities and problems that the current OV-betalen manifests from the perspective of the users, the international travellers arriving at an airport in the Netherlands. To do this the use of OV-betalen by international travellers in the Netherlands will be analyzed and a benchmark with similar systems abroad (London, Denmark, Hong Kong, see chapters 4.3 and 7) will be conducted. The benchmark helps to establish points from which the OV-betalen system could learn from and broaden the perspective on solutions by identifying processes, products, services and strategies that can lead to improvement.

With the research results from the Netherlands and the findings of the cross-case analysis a customer journey map (definition p.8), showing the touchpoints for use of the OV-chipkaart regarding international travellers entering the Netherlands via airports is developed. The customer journey is used as a communication tool with the project partners, as it provides information on the process from the users perspective in a step-by-step way to better communicate the complexity of the use processes. Furthermore, it is used to develop user-centred touchpoint concepts that together illustrate the possible usability improvements on short and long term and illustrates the business implications for these improvements.

## 01 - Introduction

### 1.6.2 Research Questions

The main research questions of stage one are questions that cover the four previous aspects: human, societal, technological and business.

- What user groups can be identified amongst international travellers who use OV-betalen?
- How do international travellers interact with the touchpoints of OV-betalen and the Dutch public transposition system?
- What problems do international travellers encounter when interacting with OV-betalen and with the Dutch public transportation system?
- How does the context of OV-betalen influence international travellers arriving at an airport in the Netherlands?
- How does the situation for international travellers in other transportation systems manifest itself in comparison to the one in the Dutch system?

### 1.6.3 Approach

To answer the research questions a mainly qualitative research approach is carried out. Qualitative research "is used in the exploration of meanings of social phenomena as experienced by individuals themselves, in their natural context." (Maletrud, 2001) According to Patton (2002) in-depth open-ended interviews, direct observation and written documents are the three kinds of data-collection methods for qualitative research. Furthermore, personal empirical insight gaining is used to qualitatively research in the field. (Patton, 2002, p.4, p.47) Hence, interviews are carried out with users and experts, observations in relevant contexts are made and documents are reviewed in order to get a complete picture of the situation for international travellers using public transportation in the Netherlands.

While quantitative research focuses on assigning numbers to the data (often creating statistics), qualitative research focuses on what the data means in-depth. The validity of quantitative data depends on standardized measuring instruments and methods, while qualitative data is based on interpretations in which different interpreters might find different meanings and therefore depends on the researchers. Hence both approaches have their strengths and weaknesses. (Kvale, 1994; Patton, 2002, p.14) Keeping these in mind during the research, is key to a successful understanding and analysis of the findings.

The method for this study is elaborated in chapter 4.



Arrivals / Aankom

MEXX

Schiphol Airport, NS ticket vending machines





Travellers at gate line of Amsterdam Bijlmer Station

### 2.1 Introduction

The project's goal is to make the usage of OV-betalen better for international travellers, thus this chapter discusses several concepts related to usage. The concepts usability, interaction and user experience are discussed as they provide insight on the way humans use products. First time use of products and services is also elaborated, as international travellers usually are first time users of the Dutch public transportation system. Product-service systems are introduced to study how international travellers interact with the service of public transport. Moreover, the implications of providing a combination of products and services and relevant theories concerning the provision and usage of technology are elaborated, as these contribute to better understand what happens when international travellers interact with the public transportation system and use the multiple (technology-based) touchpoints (definition p.9) available. In essence the literature provides background knowledge to understand that the way international travellers interact with the products and services offered, is influenced by several factors including their previous experiences, as well as the design of the product-service system and the guidance it provides in terms of feedforward (definition p.8) and feedback.

#### 2.1.1 Aim

Specify terms regarding human-product interaction and service design. Explain their relevance for the research and analysis of the study, in order to understand the current way international travellers interact with OV-betalen to ultimately make it more usable for them.

#### 2.1.2 Research Questions

- How does user-centred design relate to the study of international travellers arriving at an airport in the Netherlands, who use public transportation?
  - o How do humans interact with products and services?
  - o What characterizes first-time use of products and services?
  - o What are the implications of using technology when using products and/or services?

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### 2.2 Human-Product Interaction

#### 2.2.1 Usability, Interaction, Experience & Effects

The terms usability, interaction and user experience are defined in order to explain relationships between humans and products. The definitions provided are retrieved from the International Organization for Standardization (ISO). Additionally the relevance of usability is elaborated.

**Usability:** The “extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use.” (Source: ISO 9241-210:2010)

**Interaction:** “Bi-directional information exchange between users and equipment.” (Source: ISO 9241-210:2010)

**User experience:** A “person’s perceptions and responses that result from the use and/or anticipated use of a system, product or service.” (Source: ISO 9241-210:2010)

#### Effects

Products and services do not have just one level of usability. Usability varies depending on the user and the context of the user. Therefore interactions and users’ experiences differ per user. The usage of a product (or service) is not an isolated entity, because multiple relationships between different aspects affect it:

1. The users interact directly with the product (or service) within an environment. For example a tourist from London (user) interacts with a public transportation ticket-vending machine (products/service) at the airport (environment).
2. However within this environment there are other people that interact with the same product (or service), for instance a family (other people) from the USA interacts with another public transportation ticket vending machine (products/service) at the airport (environment).
3. Furthermore, there are more products (or services) available within the same environment, for example, there are car rental services (product/service) at the airport (environment) being used by a business man from Brasil (other people).

The way all of these elements interact with each other affect the usability of the product (or service) being used. Figure 4 shows Van Kujik’s framework for human-computer interaction of electronic consumer products and explains how human-product interaction can be evaluated: it illustrates the multiple relationships between the properties of the user (e.g. tourist from London), the product the user interacts with (e.g. public transportation ticket vending machine), the symbiotic products with which the product



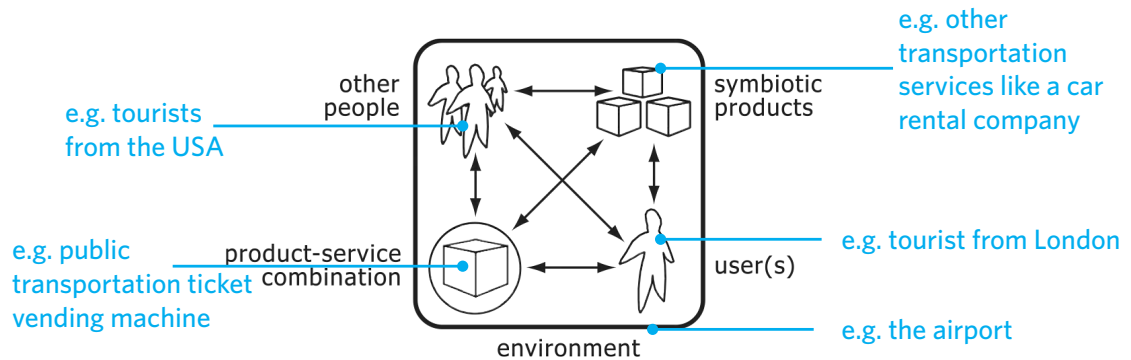


Figure 4. Framework for human-computer interaction of electronic consumer products (Van Kuijk, 2010)

interacts (e.g. other transportation services like a car rental company), other people that influence or are influenced by product usage (e.g. tourists from the USA) and the environment in which the interaction takes place (e.g. the airport) (Van Kuijk, 2010).

The manifestation and consequences of usability are directly relate to user experience, external response and business performance. For example:

1. The users' experience: the tourist from London thought it was not clear how to pay for his ticket when purchasing it at the ticket vending machine therefore he had a negative experience.
2. External response for example is embodied through word of mouth regarding the product or company so the tourist from London told his friend visiting to go from the airport by taxi, because the machines are too complicated.
3. Businesses performance: the example van Kuijk uses to explain the effect of usability on business performance directly relates to the topic of the study: "if a railway company has ticket machines that are hard to use, in order to allow customers to buy tickets with a reasonable amount of time, the company will have to buy more machines, or replace them with a model that allow for more efficient interaction."

In conclusion, usability varies depending on the user and on the context of use, therefore interactions between users and products (and services) also vary. The relationships between users, products, other users and other products within different environments have an impact on the users' experience, on external response and consequently on the businesses. In order to study the topic of international travellers using OV-betalen it is key to understand the whole picture: what is OV-betalen (product/service) and who is offering it (businesses), who is using OV-betalen (users), what alternatives are there to OV-betalen (other transportation services) and where is OV-betalen being used (environments). By understanding the whole context and taking it into account when developing solutions, it is possible to develop solutions to the current problems in a user-centred way.

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### 2.2.2 First-time use

When in a familiar environment the actions humans carry out are oriented “by a set of rules, which has proven successful previously” (Rasmussen, 1983, p. 258). In general, while executing an unfamiliar task, humans think about the separate components of the action, while with more familiar tasks the action sequence takes place more naturally (Norman, 2002, p.40). According to this reasoning, during first-time use the users will most likely carry out multiple small tasks in order to achieve their usage goal, while when they have previous experience using something the action takes place in a more automated manner as the result of carrying out these small tasks within a flow. Hence, the relationship between the human actions, the environment and their effects are decisive for meaningful interaction (definition p.8) to happen. (Rasmussen, 1983) The concept of “Meaningful Interactions” (MI) describes the reactions and emotions triggered through objects; they rationalize the relationship between people, products and contexts. (Gomes de Madeiros, 2014) When studying the current situation that travellers have with OV-betalen and more importantly when designing user-centred solutions for it, the effect the usage has on the users, in terms of reactions and emotions triggered, should be highly considered as these are related to their whole experience with public transportation.

Due to the fact, that humans approach usage of things by a learnt set of activities and sequences, in some cases misinterpretations occur. This happens because humans sometimes “generalize too rapidly, classifying new situations as similar to an old one” and therefore the sequence of activities they apply might not be correct or applicable. While humans’ ability to simplify amounts of information is extremely useful in new situations, in some cases peoples’ oversimplification can lead to usage mistakes. (Norman, 2002, p.173)

It can be concluded that people will always try to simplify content in order to operate systems by using and developing rules and skills. This means, that especially for first-time use, the risk exists that humans will generalize the use of products (and services) and experience mistakes. In terms of the study of international travellers within the Dutch public transportation system this is a relevant factor, as in most cases the interaction with the system and usage of the multiple touchpoints takes place for the first time. The design of the products and services is key in terms of guidance through feedforward (definition p.8) and feedback to the (first-time) users.

## 2.3 User Centred Service Design

### 2.3.1 Product-service systems

Baines, Lightfoot, Evans et al. (2007) define a product-service system (PSS) as “an integrated combination of products and services” which focuses on the usage of the PSS and consequently, from the business

perspective, emphasizes the “sale of the use” rather than the “sale of product”. The Dutch public transportation system is a service that consist of multiple touchpoints, which are integrated by the combination of products and services. For example, the ticket itself might be perceived as a product, while the transportation from A to B in any of the transportation modalities is a service.

The client’s perspective and involvement in early stages of the development is important to address the customers’ preferences. (Baines et al, 2007; Rese, Strotmann & Karger, 2009) Sanders and Simons (2009) discuss the topic of co-creation between companies and the people they serve. They explain the value of co-creation as “collective creativity” across the development process in regards to monetary value, use/ experience value and social value. They reinforce the idea that empathy for the people who will be affected by change is key during the development of a PSS and argue that “the earlier in the design development process that co-creation occurs, the greater and broader the likely impact”. (Sanders and Simons, 2009) Ultimately, users are the “experts of their experience” and provide significant input during knowledge development, idea generation and concept development. (Sanders and Stappers, 2012)

### 2.3.2 Technology Acceptance

Public transportation is a service to society; hence all sorts of users are in contact with it. Like for numerous other services, technology is a key element of the Dutch public transportation system and directly related to its usage. It is important to understand why some users accept technology more than others. To do this the Technology Acceptance Model (TAM) is used, it illustrates the contributing factors influencing how users accept and use a technology (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989).

Davis et al. (1989)) state that useage behaviour is directly influenced by behavioural intention. Perceived usefulness (“the extent to which a person believes that using information technology will enhance his or her job performance”) and perceived ease of use (“the degree to which a person believes that using an information technology will be free of effort”) are the decisive behavioural intentions influenced by external variables that affect the actual useage behaviour.

TAM 3, figure 5, represents an integrated model of the determinants of individual level information technology adoption and use, integrating the models proposed by Venkatesh and Davis (2000) and Venkatesh (2000) (Venkatesh & Bala, 2008). It is important to consider, that design has a direct influence on some of the determinants, which are product related as well as on some of the anchors and the adjustments. For example, the perceived usefulness of a technology can greatly be influenced by the way design affects its output quality, job relevance or result demonstrability. Furthermore, if the voluntariness to use a product is low, when for example there only are ticket vending machines to purchase a ticket and no service employees available, it can be critical to the users’ experience, because the user is being forced to use the technology.

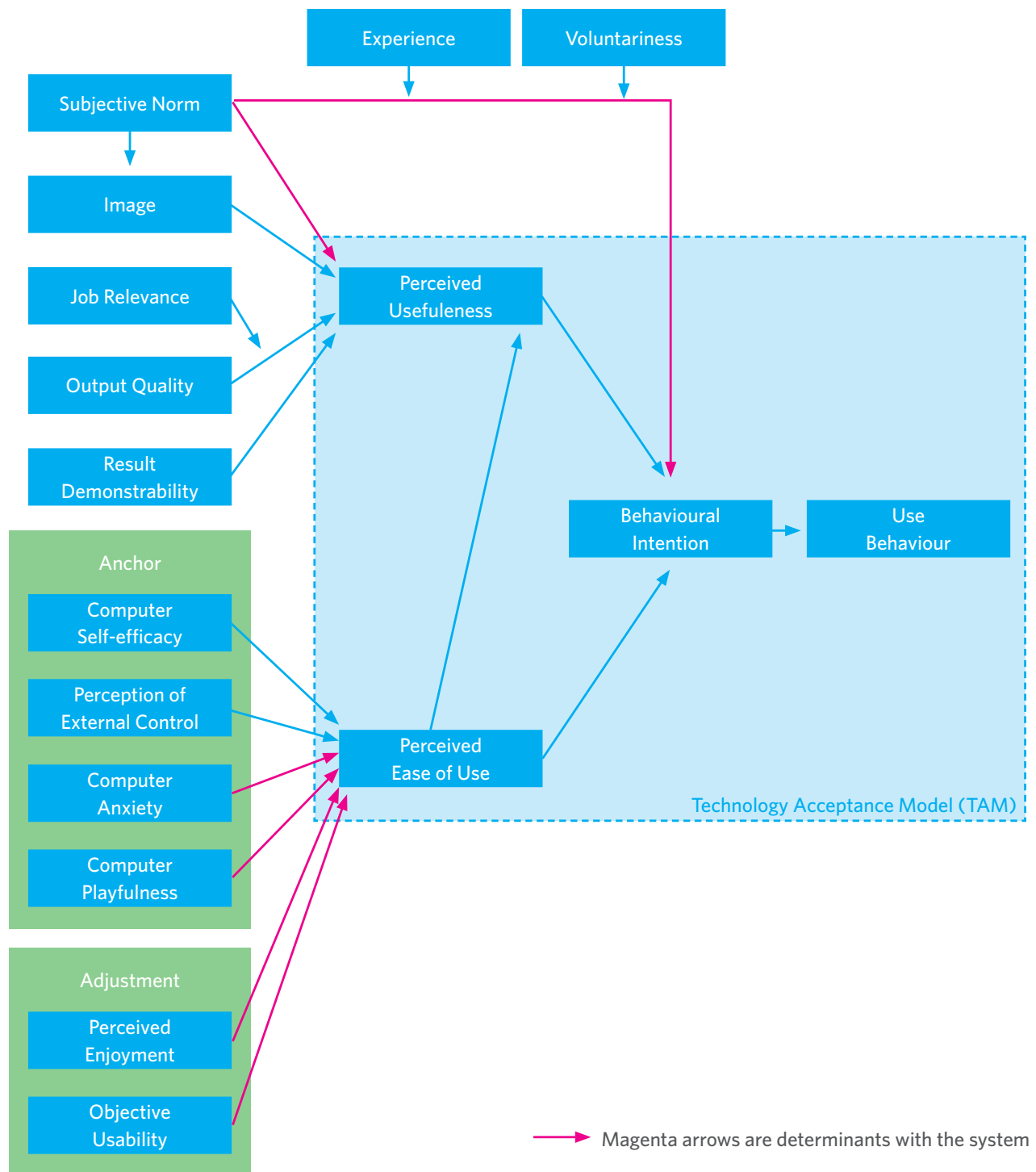


Figure 5. TAM 3 (Vankatesh & Bala 2008)

In conclusion, a better useage behaviour in relationship to technology can succeed by improving any of the determinants, this means improving usability and usefulness to higher users' voluntariness. It must be considered, that their effects are situation specific and depending on the situation the impact they have on useage behaviour will vary.

### **2.3.3 Technology-based self-service**

More and more firms are offering technology-based self-service options to consumers. Self-Service Technologies (SST) can make the functioning of the service more efficient by saving expenses and increasing productivity. Hence, these are often incorporated into marketing strategies (Dabholkar, 1996; Curran, Meuter & Surprenant, 2003; Meuter, Bitner, Ostrom & Brown, 2005, Reinders, Dabholkar & Frambach, 2008). In the case of public transportation an SST touchpoint example, prominent for the product-service system, are ticket-vending machines: the travellers purchase the product for the service independently and not with the personnel of the transportation organization. Due to the technology-based self-service (TBSS) interactions between consumers and service providers have radically changed. The implementation of technology has lowered and in some cases fully replaced the interpersonal relationship between customers and employees. (Bitner, Brown & Meuter, 2000)

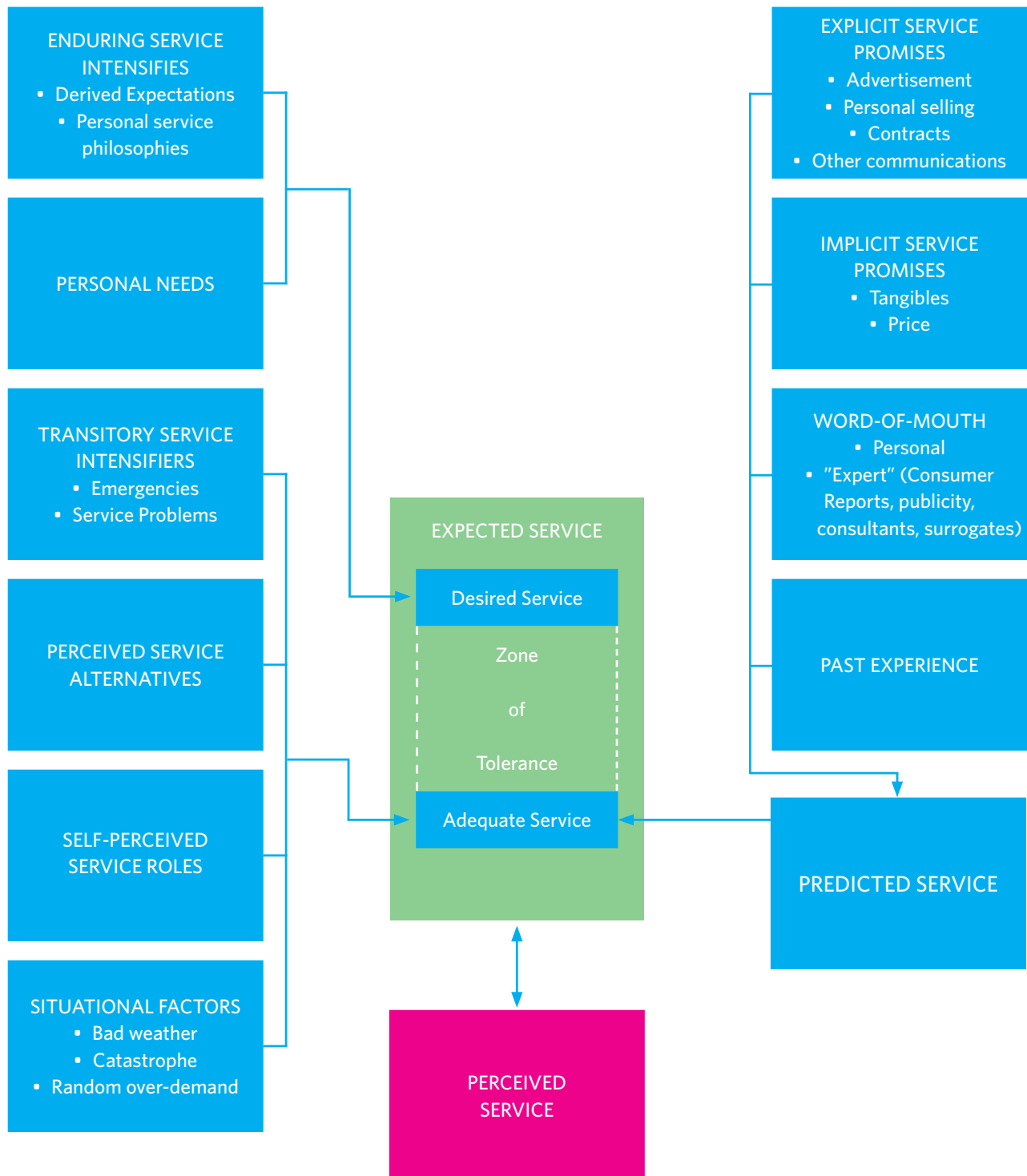
Bitner et al. (2000) describe that the "changing nature of service" has the goal to "customize service offerings, recover from service failure and spontaneously delight customers" (Bitner et al, 2000). Therefore, the application of technology cannot only benefit the company, but also the customers. However, the implementation of technology not only has positive consequences, but also has the potential to affect the system negatively as it may "raise concerns of privacy, confidentiality and the receipt of unsolicited communications" (Bitner et al, 2000). In order to optimize the service, it is essential that, the firm or service provider should understand the customer's needs and potential reactions to the change of the service, when introducing technology. (Curran et al, 2003)

### **2.3.4 Services & User Expectations**

The model of Zeithalm, Berry & Parasuraman (1993), presented in figure 6, illustrates the nature and determinants of customer service expectations. It shows the relationship between customer satisfaction and service quality assessment using three different levels of customer expectations: what the customer wants (desired service), the standards the customers are willing to accept (adequate service) and the level of service the customers believe is likely to occur (predicted service) (Zeithalm et al., 1993).

When services fail, customer satisfaction decreases. According to McCollough, Berry & Yadav (2000) this is the case even after a "high-recovery performance" by the service provider - no failure in the provided service is perceived as better by the consumers than firms "responding with superior recovery" (McCollough et al. 2000). According to Maxham III & Netemeyer (2002) firms need to learn from their failures in service provision, as customers most likely will not tolerate service recovery twice (Maxham III

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& Netemeyer, 2002). However, according to Chang (2006) customers tend to have a positive response if the service providers offer a range of service recovery options, due to the likeliness that they experience perceived control over the service process, which is linked to positive affect (Chang, 2006).

When discussing TBSS, Reinders et al. (2008) provide a range of examples, like “self-scanning in grocery stores in many small Swedish towns” and enhance the fact, that in these cases the customer is forced to use the provided self-service without having further options for the service to take place (Reinders et al., 2008.). Forcing the consumers to use a TBSS may result in negative effects on the attitudes towards using a TBSS and on the evaluation of the service provider (Reinders et al., 2008). The first-time use “often involves a significant behaviour change” for the user (Meuter, Ostrom, Roundtree & Bitner, 2000). The “consumer readiness” to use TBSS is significantly affected depending on whether or not the customers clearly understand their role when interacting with the TBSS. The customers’ motivation to use the TBSS is often related to the perceived benefits it provides and if they believe, that they are able to use it (Meuter et al., 2000), as previously explained with TAM3. By providing alternatives to the customers, who have some type of problem with the usage of TBSS, the customers’ perceived control over the service process is likely to be more positively affected (Chang, 2006).

In conclusion, customer expectations are based on what the customers want, the standards the customers are willing to accept and the customers prediction of the service they will receive. Service failure is most likely not to be tolerated twice and if it does take place the provision of a range of recovery alternatives is preferred by the customers. Technology-based self-service provides various benefits to both, the companies and the customers. However, companies should realize that alternative solutions should be provided to customers. During the research regarding international travellers’ use of the public transportation system, it is relevant to study the aspect of system failure and the possibilities the users perceive as solutions. Furthermore, focusing on TBSS is relevant as these more and more are part of the system.

### 2.4 Conclusions

The concepts and theories presented in this chapter help to understand how people, especially first time users, use and accept products and services and to understand how international travellers approach the usage of the public transpiration system in the Netherlands. It is established that first time users can make usage mistakes due to mental models (Rasmussen, 1983) and that sometimes significant behavioural changes must take place (Meuter, Ostrom, Roundtree & Bitner, 2000) to use something successfully, which might result in a negative effect on the users experience and therefore on the evaluation of the service provider (Reinders et al., 2008).

The role of technology is increasing within product-service provision and highly affects the way products and services are perceived and experienced. This also has a direct impact on the businesses, as it is the case with OV-betalen. However, taking a user-centred approach to develop product-service systems that provide technology-base touchpoints can impact the use experience of the users positively.

To do this, it is key to understand the whole OV-betalen context, as the effects of the system on the users are situation specific and depending on the situation the impact they have on use behaviour will vary. A better useage behaviour in relationship to technology can succeed by improving usability and usefulness to higher users' voluntariness. This can be achieved through a design that influences the determinants (TAM3, 2008) to ideally motivate the users to use the PSS, show the benefits of the PSS clearly and make the role of the users, when interacting with the PSS, evident (Meuter et al., 2000).

The following chapter presents the context of OV-betalen and its relationship to international travellers to better understand the possible situations users can experience.





Traveller in Leiden Central Station at NS TVM



# 3

connexxion

AMSTERDAM AIRPORT

schiphol \* sternet

## The public transportation system & international travellers in the Netherlands - 03

### 3.1 Introduction

In the previous chapter knowledge was established in regards to human-product interaction, product-service system and technology-based services. It was established that, in order to study and develop user-centred solutions to current problems the system has, the context of OV-betalen in relation to its usage by international travellers must be understood. The purpose of this chapter is to introduce how the public transportation system in the Netherlands works and to describe the relevant aspects of the system for international travellers arriving at an airport in the Netherlands. A clear picture of how the system is set up and its manifestation in regards to international travellers establishes the scope of the project and provides parameters to create the method for the field research. This chapter provides an introduction to the way the Dutch public transportation system works, including its operational set-up as well as the OV-chipkaart's development history, the existing payment options and relevant trends for future development. It also presents relevant data on inbound tourism, the stakeholders for international travellers arriving at an airport in the Netherlands, who use the public transportation system and main travel patterns of international travellers and available public transportation touchpoints.

#### 3.1.1 Aim

Explore the workings of the Dutch public transportation system with the purpose to understand its contextual set up and what the relevant aspects of the system concerning OV-betalen for international travellers are. Describe how the situation for international travellers in the Netherlands manifests in order to create a research method to study how the context of OV-betalen is experienced by international travellers.

#### 3.1.2 Research Questions

- How do the workings of the Dutch public transportation system relate to the use of public transportation by international travellers arriving at an airport in the Netherlands?
  - o How is the Dutch public transportation system set-up?
  - o What public transportation payment (OV-betalen) possibilities exist for international travellers in the Netherlands?
  - o What are current payment trends relevant to the development of the system?
  - o Who are the stakeholders for international travellers arriving at an airport in the Netherlands and what are their interests?

### 03 - The public transportation system & international travellers in the Netherlands

- o How does the context of use of public transportation manifest itself in regards to international travellers arriving at an airport in the Netherlands?
- o What touchpoints can international travellers interact with, when using the Dutch public transportation system?

#### 3.1.3 Method

Several sources from different public transportation companies, the Dutch government and affiliated organizations (like the Netherlands Board of Tourism & Conventions Holland Marketing and the Nationaal Openbaar Vervoer Beraad) and the 2013 TU Delft study „Exploring new possibilities for user-centred e-ticketing“ are consulted. Furthermore, interviews with the project partners are carried out, to learn about the companies and their interest on the topic of international travellers. Significant weight is set on understanding the different companies’ goals and views on the current situation.

Based on the information gathered, the factors influencing the journey of international travellers were identified; specifically how these relate to the usage of public transportation tickets.

#### 3.2 Workings of the Dutch Public Transportation System

##### 3.2.1 Operational Set-up

In the Netherlands the public transportation system is provided by several public transportation operators, that in total provide a range of train, metro, tram, bus, ferry and other services such as bicycle rental. The government grants concessions to the transportation operators to offer transportation services to the

Dutch public transportation operators											
Public transportation company		01. Arriva	02. Connexion	03. EBS	04. GVB	05. HTM	06. NS	07. Qbuzz	08. RET	09. Syntus	10. Veolia
Transportation Modality	Train	●	●	●	●	●	●	●	●	●	●
	Tram	●	●	●	●	●	●	●	●	●	●
	Metro	●	●	●	●	●	●	●	●	●	●
	Bus	●	●	●	●	●	●	●	●	●	●
	Other	●	●	●	●	●	●	●	●	●	●

Figure 7. Overview of Dutch public transportation operators and their transportation modalities

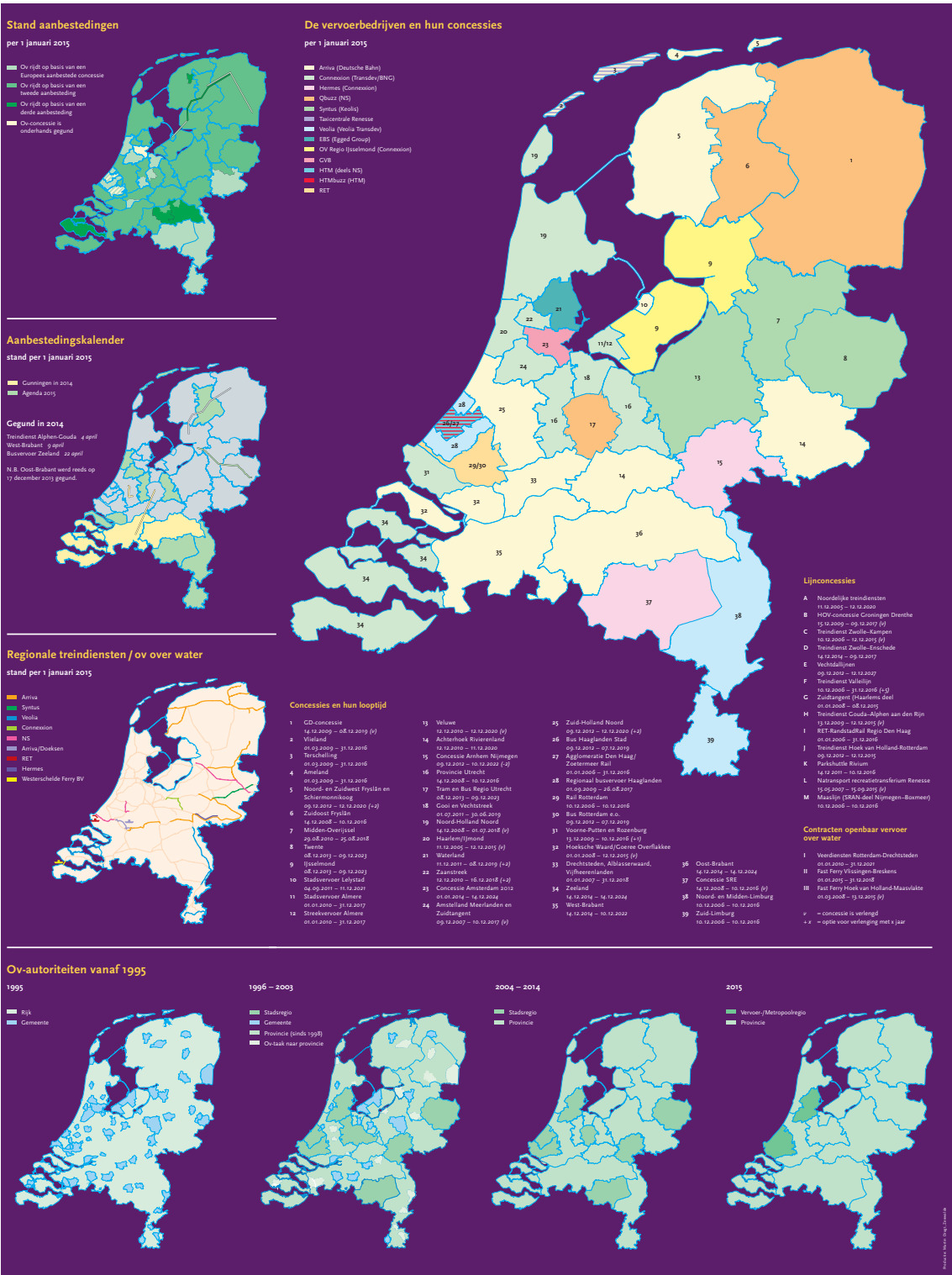


Figure 8. Concessions map of regional public transport in The Netherlands for 2015

### 03 - The public transportation system & international travellers in the Netherlands

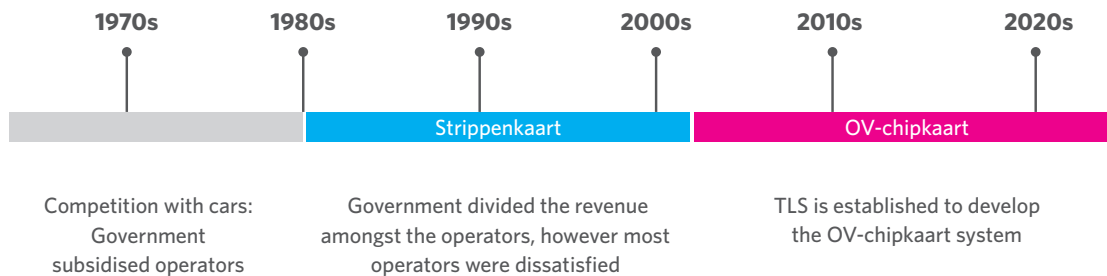


Figure 9. Timeline of developments in the Dutch public transportation system

whole country. NS is the only company that provides a countrywide service, as it provides train services in the main railway network. The other companies, including Arriva, Connexxion, EBS, GVB, HTM, Qbuzz, RET, Syntus and Veolia, have concessions determined by the governments of provinces and urban regions. (Organization of Public Transport., Government.nl, n.d.; Translink.nl, n.d.) Figure 7 gives an overview of the services the different public transportation operators provide in terms of the transportation modalities that passengers use and figure 8 shows an overview of the 2015 regional concessions.

The Netherlands is the first country in the world to have an integrated national electronic ticket system, the OV-chipkaart. Other countries have large electronic ticketing systems, but these usually only work within one city, like the ones used in Hong Kong (the Octopus card), Greater London (the Oyster card) and Singapore (Opal card). The implementation of such a system in the whole country involved several public transportation operators and the participation of the national, the regional and the local governments to work together, making the coordination of all aspects of the system more complex than when less parties are involved. This is mainly because the parties all have a common objective, that they want to implement together, but still have individual considerations for their own business.

#### 3.2.2 Development of the OV-chipkaart system

In the 1970s the Dutch government started subsidizing public transportation operators due to the high competition these experienced with cars. A national tariff system called "Strippenkaart" was introduced in the 1980s, with the purpose to make travelling around the Netherlands easier, without having to purchase tickets from different operators. The government divided the revenue amongst the operators. However most operators were dissatisfied and believed to be earning less money than what corresponded to their share. Due to the fact that operator losses kept increasing and the government increased subsidies in the 1990s. Two state-owned corporations operated national public transport (NS: trains & VSN: regional buses) and city-owned corporations covered transportation for (larger) cities. Hence, the government





Figure 10. Ticket validators: gates (left) and poles (right)

decided to liberalize and decentralize public transportation to ultimately make it self-sustaining. In the meantime several operators invested in developing new electronic tickets with financial support from the government.

In the 2000s the joint venture Trans Link Systems (TLS) was formed (year 2001) by NS, GVB, RET, HTM and Connexxion in order to set up a national electronic ticketing system. The government set up requirements for the minimum scope of the system. Tenders were given (year 2003) to the East Western Consortium to develop the new electronic ticketing system. The new national electronic ticketing system “OV-chipkaart” was implemented (2011) and the national tariff system withdrawn by the Minister of Infrastructure. See figure 9.

### 3.2.3 How the OV-chipkaart system works

In the Dutch public transportation system, travellers must acquire an electronic ticket and load a monetary value on it; the card is the carrier of a so-called travel product. To use it travellers must validate the card each time when entering (checking-in) and exiting (checking-out) a station (usually for transportation with train and metro) or vehicle (usually for transportation with buses and trams). The validation can happen either at a gate or at a validation pole as shown in figure 10. The fare is based on the distance travelled and because the fare is calculated at the end of each trip (when the card is checked-out) a deposit is taken from the card when checking-in and the excess money deducted is returned at check-out. Operators have different fares depending on time, usage and location. (Joppien et al., 2013) This procedure applies in most cases, however some tickets like single-journey tickets, which are discussed further in chapter 3.3, have a fixed value. In some cases the tickets contain shared products amongst several companies. A detailed visualization of the public transportation ticket types offered by the project partners can be found in appendix B. Chapter 3.3 provides a detailed description of the different types of tickets.

### 03 - The public transportation system & international travellers in the Netherlands

Checking-in and checking-out was one of the main incentives to develop the electronic payment system in the Netherlands, especially its relation to security: Placing gates at the entrance of stations and providing smart cards (that worked as keys to these gates) would lower insecurity at stations and fare evasion would decrease. (Joppien, Niermeijer and Niks, 2013). This is a relevant insight that provides knowledge on the motives behind the changes and the way the operators and government have cooperated for decades. Currently the biggest railway stations are gated and the vast majority of metro stations in Amsterdam and Rotterdam are fully gated. NS aims for 90% of travellers to encounter at least one gate at railway stations during each trip to secure proper payment. Each company decides individually whether gates are placed to pay for their service or not.

Up until today the operators must cooperate with each other and with the government to further develop and implement changes to the system. However, currently the public transportation companies provide their own services, such as providing travel information on websites or screens at station, as well as having their own service employees. The only common denominator that the companies have is TLS. TLS manages the payment system in terms of technology and finance, but also provides its own customer services, for example, through the OV-chipkaart website. This shows that even though the OV-chipkaart system is a joint effort by the multiple public transportation companies, each of them acts as an individual entity.

The following chapters specify the workings of the system related tickets and payment and provide an overview of all the stakeholders for international travellers and public transportation, as there are more than the public transportation companies.

### 3.3 Payment: Ticket Options

#### 3.3.1 OV-chipkaart & OV-betalen

The OV-chipkaart is a smartcard the size of a credit card, that enables public transportation users in the Netherlands to travel on all modes of public transport. "OV" stands for Openbare Vervoer, which translates to public transportation and "chipkaart" translates to chip card, hence OV-chipkaart is the public transportation chip card. Multiple forms of OV-chipcards exist and the sum of these ways of payment for public transportation in the Netherlands is labeled "OV-betalen". OV-betalen translated into English means public transportation payment.

In this report the OV-chipkaart refers to the plastic electronic card itself, while OV-betalen includes different forms of public transportation tickets and their respective travel products. Figure 11 shows an OV-chipkaart (left), and also examples of other forms of tickets (centre: the GVB one hour ticket, right: / *amsterdam* card), all forms are included within OV-betalen.





**Figure 11.** Examples of different types of tickets within OV-betalen: (Personalized) OV-chipkaart (left), GVB 1 hour ticket (centre), I amsterdam city card (right)

Through an intensive search amongst the project stakeholder companies' (NS, GVB, RET Connexxion) websites it became evident, that they differentiate between four types of tickets available within the public transportation system:

1. Personal OV-chipkaart
2. Anonymous OV-chipkaart
3. Paper ticket with chip, often referred to as Disposable OV-chipkaart
4. Paper ticket with no chip

The following descriptions provide a description on the diverse functions of these four types of tickets:

1. Personalized OV-chipkaart : "This card displays a name, date of birth and photograph and can only be used by the cardholder. A range of services are offered with this card, including passes with different operators, automatic reloading, blocking if the card is reported lost or stolen, a credit refund when the card is terminated and an online transaction overview." (Translink.nl, n.d.)
2. Anonymous OV-chipkaart: "This card does not display any personal details. It can therefore more than one passenger can use it - but not at the same time. A limited range of services are offered with this card (including credit refund when the card is terminated and an online transaction overview)." (Translink.nl, n.d.)
3. Paper tickets with chip differ from an electronic plastic "OV-chipkaart" in the sense that they can only be used for a specific amount of travels and cannot be recharged. Hence, they are made out of paper, these include single journey tickets and various of the tourist tickets.

### 03 - The public transportation system & international travellers in the Netherlands

4. Paper tickets with no chip are only sold and used in particular cases and are the least widespread. This type of tickets, for example, can be validated with printed QR codes or only controlled by service employees in some of the public transportation companies' ferry services or in international trains.

Multiple names for the paper tickets with a chip are used, like "Disposable OV-chipkaart", "paper-chip ticket" or "single-use chipkaart", as well as for the paper tickets with no chip, which were referred to as "paper ticket" and "Not-chip ticket". In this study the following terms will be used to describe the types of tickets within OV-betalen: Personal OV-chipkaart, Anonymous OV-chipkaart, Disposable OV-chipkaart and Paper ticket with no chip. Please note that the "Business OV-chipkaart" (Translink.nl, n.d.) is not part of the study's scope.

#### 3.3.2 Future developments

A vision on future payment for public transportation generated by a national public transportation deliberation group, the Nationaal Openbaar Vervoer Beraad (NOVB), provides an overview of relevant trends considered in the development of payment methods. These therefore directly influence the purchase of tickets within the sector. The following trends might influence user-centred solutions for the current problems international travellers experience when selecting, purchasing and using tickets for public transportation during their stay in the Netherlands, therefore they are relevant to keep in mind during the study. The prominent trends are EMV, Be-in Be-out, mobile payment and single check-in check-out. (NOVB, 2014),

EMV is the abbreviation for Eurocard, Mastercard and Visa, which are the bankcard payment options that embody the standard of contactless payment. Contactless payment refers to the functionality that allows bankcard users to hold their card against a reader and pay without physical contact between the card and the reader. In terms of payment for public transportation in the Netherlands, this would mean that instead of using a ticket bought from the public transportation operators, the travellers could use their own bankcard. The travellers would have to validate their cards at the start and at the end of their journey, in order to determine the correct fare. Figure 12 shows the validator for contactless payment in the Transport for London system.

Mobile payment refers to the use of smartphones to pay for public transportation, the same way current electronic tickets are used. In this case the smartphones could be equipped with EMV-chips or SMART-OV and would have to be validated at the readers to check-in and check-out (see example in figure 13). The banks would transfer the payment to the public transportation operators. The travellers could access their payment data on their smartphones. The opportunity to provide this service to international travellers has the benefit, that they could pay for public transportation in the Netherlands, ideally, in a more straightforward manner, without having to purchase the tickets at the ticket vending machines or at the counters.

Be-in Be-out (BIBO) is a concept of payment in public transportation in which travellers would not have to actively check-in or check-out of the system, but the system (or vehicle) would recognize and calculate the corresponding fares through location-based technology. The system could calculate this for example through smartphones, using GPS and beacons. One of the main benefits of this system would be that travellers would not forget to check-in and check-out. Nonetheless, one of the main concerns would be traveller privacy.

Single check-in check-out is when the traveller only has to check-in at the beginning of the travel and check-out at the end of the travel, which currently is not the case due to operator complexity: In the Netherlands multiple operators run public transportation, when travellers interchange lines ran by different operators, they must check out at the validators (gates and poles) from one operator and check-in again at the validators of the other operator. Single check-in and check-out would simplify the interaction with the system for all travellers, as it would prevent them from making mistakes when validating at the wrong operator and it would reduce the amount of validators at stations and platforms.



Figure 12. EMV: Contactless bankcard payment validator in Transport for London system



Figure 13. Smartphone payment at the gates, photo from pilot in the Dutch system, February 2016

## 03 - The public transportation system & international travellers in the Netherlands

### 3.4 International Travellers in the Netherlands

In the previous part of this chapter described the workings of the Dutch public transportation system to establish an understanding of the context of the OV-betalen system as a whole. In this section the relationship between international travellers arriving at an airport in the Netherlands, who use OV-betalen is described. To do this, relevant statistical information regarding inbound tourism in the Netherlands is provided, the different stakeholders of this user group are defined, the travel patterns of international travellers are illustrated and the range of available touchpoints, they have to interact with the system, are listed. Understanding the public transportation context and its relationship to the different aspects, that influence the experience of international travellers, serves to define how the experience of international travellers using OV-betalen is and to select the proper study areas for research in the field.

#### 3.4.1 Background & Context Information about International travellers in the Netherlands

Gaining an overview on international travellers in the Netherlands is important, to understand the composition of the user groups and the situations they are in when using public transportation in the Netherlands. The General Report 2014 Inbound Tourism Survey published by Netherlands Board of Tourism & Conventions (NBTC) Holland Marketing, which is responsible for branding and marketing the destination Holland, is used as the main source to provide this overview. The study comprises international visitors who stay in the Netherlands for more than one day. The ten most significant facts that provide contextual information about international travellers visiting the Netherlands from the NBTC report are selected.

The facts answer questions in respect to where the travellers come from, what they visit in the Netherlands, what kind of activities they do and what means of transportation and information sources are used. The facts about international travellers gathered by NBTC Holland Marketing provide an overview on what is happening with regard to international travellers in the Netherlands quantitatively and provide guidance to establish the context of the field study, which qualitative studies how and why international travellers use public transportation. A visualization on appendix E presents the following results:



1. 80% of the international travellers come from Europe, out of these 80% most visitors are from Germany, the United Kingdom and Belgium. Thus, one out of five visitors in the Netherlands is not European.



2. Most international travellers, namely 61% travel to the Netherlands for leisure, followed by 26% of travellers who travel to the Netherlands for business matters. 2% of international travellers visit the Netherlands for sports and the resting 4% of travellers have other purposes.



3. More than half of the international travellers stays within a period of one to three nights. One third of travellers stay for a period of four to seven nights and more than 8% of travellers stay over 8 nights.



4. 34% of travellers travel as a pair without children, 23% of travellers travel on their own and 17% are multiple adults without children. On fourth place, making 10% of the total, are families with children aged between 0 and 12 years old, followed by 9% of the total composed up by colleagues who travel together. Moreover, families which travel with children aged between 13 and 18 years make 6% of the total and the resting 2% are other compositions.



5. Most travellers, namely 5,000,000 yearly, visit Amsterdam, while 2,000,000 visit the coast. 25% of the total of travellers visit further big cities such as Rotterdam and The Hague. 20% of travellers visit further attractions, like Keukenhof or Zaanse Schans.



6. Amongst many other activities, the most common include walking through the city, visiting gastronomic locations, shopping and visiting museums and further attractions.



7. The majority of international travellers, 44%, travel to the Netherlands via airplane. Out of these 44%, 96% arrive to Schiphol Airport and the resting 4% to regional airports. Not far behind airplanes, the second most common means to travel to the Netherlands are cars, followed by 8% arriving via train, 3% arriving with coaches and 4% with further means of transportation.



8. Within the Netherlands 31% of international travellers travel by car, 19% travel on foot and 19% use trains. 14% use further transportation means like trams, buses and metro. 9% use bicycles, followed by 7% of travellers who use taxis and 4% who travel by coach, leaving 2% of traveller using other transportation means.



9. 87% of travellers use the internet as their main source of information and 50% use apps related to their destination. The most searched and booked things are accommodation providers (by 69% of travellers who search online), attractions and museums (by 31% of travellers who search online), carriers (by 29% of travellers who search online), cities and regions (by 20% of travellers who search online) and travel organisations (by 17% of travellers who search online).



10. As stated in the introduction, improving the public transportation is the third main complaint by international travellers. In first place international travellers complain about the lack of information provided and in second place about the price level in the Netherlands.

### 03 - The public transportation system & international travellers in the Netherlands

Conclusively, these facts provide an overview of the current situation, to better understand the user group segmentation and the relevant contexts for this segmentation. The fact that most international travellers arrive at Schiphol airport in the Netherlands, highlights the relevance to cater to this specific user group. Furthermore, the use of public transportation is in total lower, than the usage of cars, and reinforces the idea that sustainability of public transportation could be improved by attracting more travellers to use it. Moreover, the fact that Amsterdam is the most visited place in the country, highlights the need to spread travellers around the whole country and a good public transportation is a means to successfully do so.

#### 3.4.2 Stakeholder Overview

As previously mentioned, not only the transportation operators and the government are stakeholders to international travellers arriving to the Netherlands via airport, there are several more:

In first place international travellers are stakeholders of the product-service system themselves. In figure 14 travellers are positioned as the most important group, as without them and their need of mobility there would be no necessity of providing public transportation. The travellers group is split into domestic travellers and international travellers.

International travellers have direct contact with the system at the points of entry, which are categorized into airports and railway stations. Travellers arrive to the country or destination, interchange between transportation modalities and leave the country or destination from there. The points of entry are directly linked to the transportation organizations, both Dutch, covering the public transportation organizations, and international which are passenger airlines (including the Dutch carrier airlines) and other transportation modalities that travellers have access to, like rental cars, taxis or private tours amongst others (which also can include Dutch companies), as these are the organizations and companies offering transportation services to (international) travellers. Furthermore, international travellers have direct contact with retail at these points of entry, where transportation touchpoints might be available, such as sale of public transportation tickets. Additionally, international travellers have contact with further during their stay in the Netherlands, at other locations such as at their hotels, where again public transportation touchpoints might be available.

Consumer organizations represent mainly domestic travellers and inform the government and operators of problems in order to influence the requirements set to the organizations by the government when granting concessions. Translink Systems manages the payment system in terms of technology, finance and by

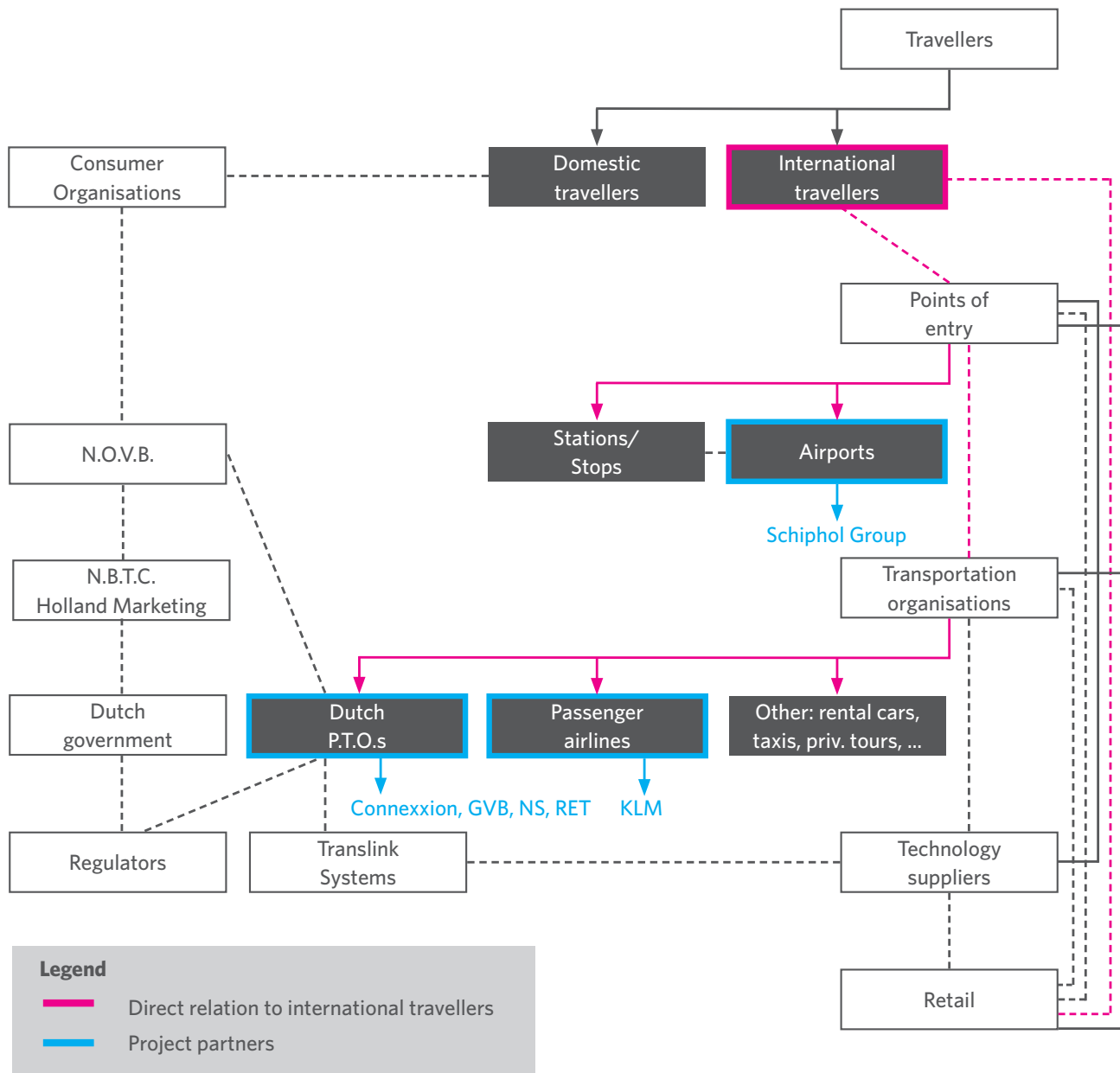


Figure 14. Overview of stakeholder relations highlighting (in magenta) the direct contact to international travellers



### 03 - The public transportation system & international travellers in the Netherlands

providing direct customer service on their website, usually for Personal OV-chipkaart owners. The role of the regulators is to check if the system managed by the public transportation operators and Translink system remains within the law. The N.O.V.B. is a discussion group formed by the (regional and local) governments and authorities as well as consumers and transport operators.

NBTC brands and markets the Netherlands nationally and internationally, supported both by the government and other parties to make the Netherlands as a destination more attractive and unite both public and private partners.

Additionally, technology suppliers are related to the points of entry, to the public transportation organizations, to Translink Systems and to retail as they provide the means for the different systems to operate.

Even though the stakeholders are connected to each other for functional reasons their cooperation could benefit from stronger bonds to operate together, as currently the workings of the separate entities provide a non-optimal customer experience in the sense that the interactions between the customers and the individual organizations all happen separately. Creating a stronger synergy between these individual entities, will improve the customer experience of (international) travellers by providing more of a seamless journey.

Figure 14 provides an overview of the stakeholder relations, highlighting (in magenta) the direct contact they have to international travellers and to which group the project partners belong (in blue). A detailed description of each of the parties can be found in appendix C.

#### 3.4.3 Travel Patterns

With the knowledge regarding inbound tourism and an overview of the stakeholders for international travellers using public transportation in the Netherlands, the context of use of public transportation by international travellers arriving via an airport can be described in regards to possible locations and travel journeys that compose travellers' journeys when travelling from abroad to the Netherlands. By specifying these locations and journeys it becomes important to investigate which are the relevant travel patterns, that must be studied to research the current experiences travellers have.

The Dutch research context in terms of international travellers' travel patterns is illustrated using a conceptual map, figure 15, that shows locations, travel journeys, the respective travel modalities and relevant stakeholders (including project partners). The scope of the Dutch context is narrowed down to Amsterdam and Rotterdam, as these two cities are the largest in the Netherlands. Furthermore, the airport Amsterdam Schiphol is the largest in the country (CBS Statline, n.d) and the seventh busiest airport by international travellers worldwide (Year to date, 2015). The Rotterdam airport is the third most frequented airport in the Netherlands (CBS Statline, n.d) and is considered a representative for further local Dutch airports, like Eindhoven Airport and Lelystad Airport. Figure 15, shows the four main travel patterns that international travellers can experience throughout their travels. The term "travel pattern" refers to the actual journey from A to B. The respective public transport modalities are indicated per travel pattern. It is assumed that the traveller's journey starts in their home.



**Travel pattern 1:** Transport from home country to Dutch airport - The first journey that travellers undertake is from their home country to a Dutch airport. This project focuses on international travellers arriving to the Netherlands via airplane; therefore the only travel modality considered is the aeroplane. The project partner KLM plays the main role in this travel pattern, nevertheless further airlines are considered to be part of it.

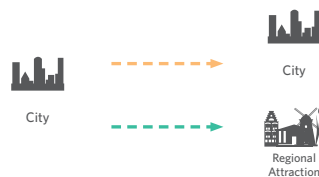


**Travel pattern 2:** Transport from Dutch airport to city and in some cases to hotels along the way - The second journey undertaken by international travellers regularly is from the Dutch airport to the nearest city. Within the scope of public transportation, travellers can travel via bus or train. Within the Amsterdam area the transport modalities belong to NS, GVB and Connexxion, while in the Rotterdam they belong to RET.

### 03 - The public transportation system & international travellers in the Netherlands



**Travel pattern 3:** Transport within the city - The third journey is related to the transport within the city. The public transportation modalities are buses, trams and the metro. In Amsterdam the modalities belong mainly to GVB, but in some cases also to Connexxion, while in Rotterdam the modalities belong to RET. In this area hotels and attractions are further locational stakeholders.



**Travel pattern 4:** Transport outside of the city is split into two different types of journeys, travel from one city to another city and travel from the city to a regional attraction.

4.a) Transport from city to city - Generally in the whole country the public transport from city to city is with the train, therefore NS is the main stakeholder in that segment.

4.b) Transport from the city to a regional attraction - In the whole country NS plays an important role. Within the area of Amsterdam GVB and Connexxion play the largest role, while in the Rotterdam area it is RET.

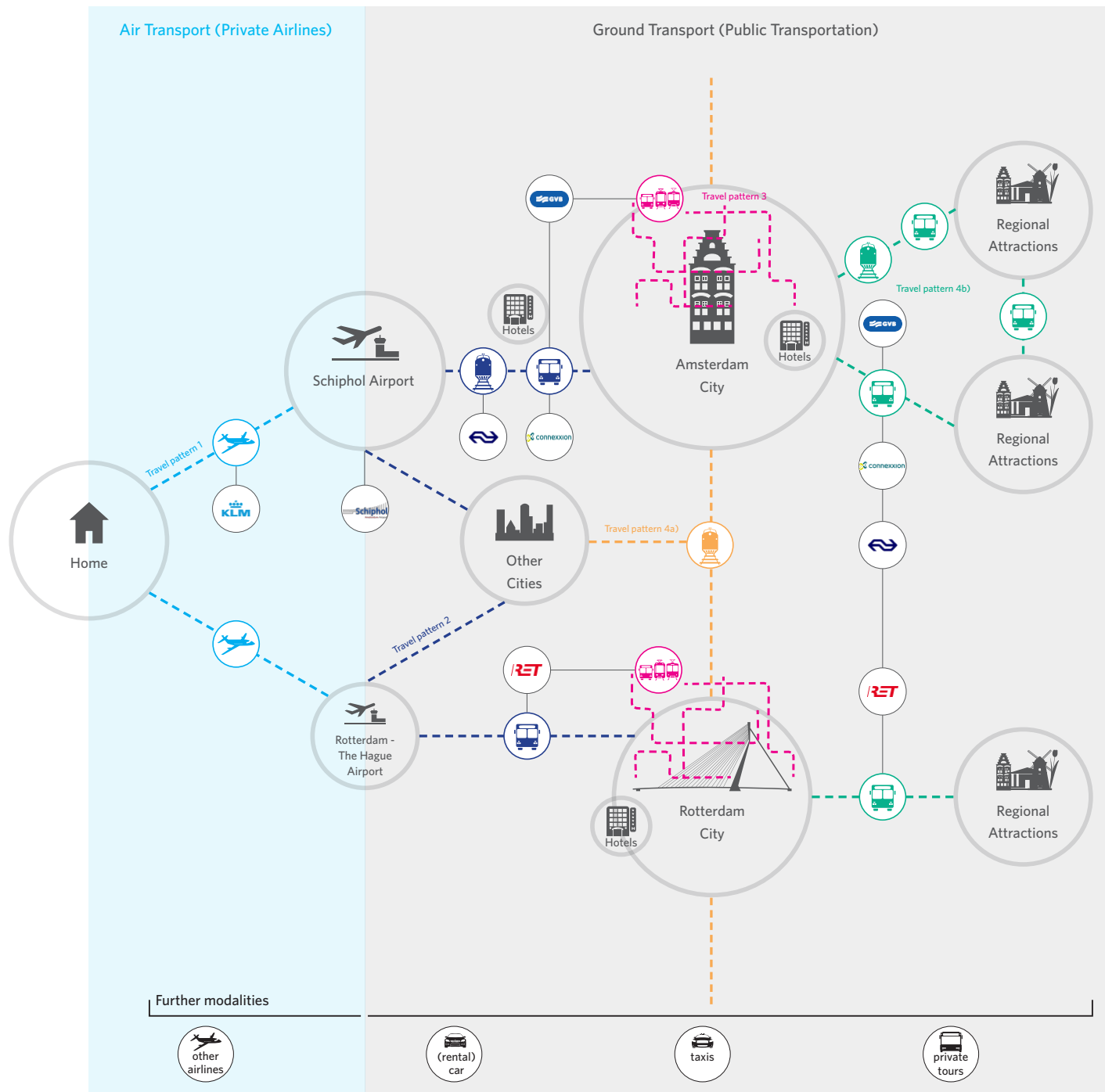


Figure 15. Conceptual map that shows locations, travel segments, the respective travel modalities and stakeholders

## 03 - The public transportation system & international travellers in The Netherlands

### 3.4.4 Touchpoints for international travellers

Travellers come across different points of contact when interacting with the public transportation system throughout the different travel patterns. These moments of contact with the product-service system are defined as touchpoints.

In this study the touchpoints relevant to the travellers journey are split into five groups, see figure 16. The groups one to four are directly related to the public transportation organization, while the fifth group includes touchpoints related to public transportation that are provided by other sources and not the public transportation organizations.

These individual touchpoints and their groups depict a general composition of the touchpoint possibilities that travellers come across, as not all the public transportation organizations provide all of the touchpoints.

**1. Machines:** Within the context of stations public transportation travellers interact with a range of machines. Ticket vending machines and add value machines are used to purchase tickets or add value to electronic cards. At the payment borders the travellers must validate their tickets when entering and exiting a station (when using trains and the metro) or when entering and exiting the vehicle (usually when using buses and trams). Furthermore, at stations Information/SOS poles are available and in some stations pick up devices for users to collect certain products.

**2. Information/ Communication Provision:** The public transportation system uses a diversity of media to communicate and provide information to the travellers. The type of media used within the context of the public transportation system at stations or in the vehicles is categorized as tangible, while the media, which the travellers can access online is categorized as digital. The tangible information and communication provision most commonly is communicated through signage, maps, screens, poster, stickers and brochures and the digital information provision usually through websites and apps.

**3. Personnel Service:** The public transportation system requires a range of service employees, who also are an important contact point between travellers and the system. The employees have different roles, the personnel at service desks usually provides information, troubleshoots problems and sells tickets, the employees, who are walking around at stations do the same, however both their roles differ as the users have to actively approach a service desk, while the walking employees also approach users on the spot and often during the moment of use (for example provide assistance at ticket vending machines). Drivers in

1. Machines	2. Information Provision	3. Personnel Service	4. Other Services	5. Non - public transportation related
<ul style="list-style-type: none"> <li>▪ Ticket vending machines &amp; Add value machines</li> <li>▪ Payment borders: Gates (closed payment borders) and validators (open payment borders)</li> <li>▪ Information/SOS poles</li> <li>▪ Pick up devices</li> </ul>	<p><b>Tangible</b></p> <ul style="list-style-type: none"> <li>▪ Screens</li> <li>▪ Posters</li> <li>▪ Stickers</li> <li>▪ Brochures</li> </ul> <p><b>Digital</b></p> <ul style="list-style-type: none"> <li>▪ Websites</li> <li>▪ Apps</li> </ul>	<ul style="list-style-type: none"> <li>▪ Service desks</li> <li>▪ Walking employees</li> <li>▪ Drivers</li> <li>▪ Conductors</li> </ul>	<ul style="list-style-type: none"> <li>▪ Phone help desks</li> <li>▪ Letter communication</li> </ul>	<ul style="list-style-type: none"> <li>▪ Travel guides/ blogs/ websites</li> <li>▪ Word of mouth (friends, family, etc.)</li> <li>▪ Media (articles, reportages, etc.)</li> </ul>

Figure 16. Overview of available touchpoints for travellers when using the Dutch public transportation system

some cases not only drive the vehicles, but in the cases of buses and trams often also provide information and sell tickets. Conductors check the validity traveller's tickets while in the vehicle and provide information when requested by travellers.

**4. Other services:** The public transportation system offers further services to the travellers, that are touchpoints with the system, like phone help desks or communication via letter. This category will not be considered further during the study, as it is less relevant for international travellers, because they are mostly addressed to and used by domestic travellers and usually attend long-term issues, like Personal OV-chipkaart subscriptions and seasonal passes.

**5. Non-public transportation related touchpoints:** Users of the public transportation system not only have contact with the system through touchpoints provided by the system. In the case of international travellers further sources can have great relevance for the users of the system, such as travel guides, blogs and websites, word of mouth and media. These touchpoints usually are used as informational sources.

### 3.5 Conclusions

This chapter has provided an overview on different aspects that describe the functioning of the Dutch public transportation system. The development of the system and its organizational set-up were established, as well as the different types of tickets available within OV-betalen. Furthermore, travel patterns of international travellers were identified that provide insight on the relevant contexts of use for the study and available touchpoints. It can be concluded that the Dutch public transportation system is a complex entity that functions through the work and collaboration of many components, including the multiple stakeholders, the different contexts in which international travellers have contact with the system, the availability of different touchpoints and the variety of tickets within OV-betalen. The relationship between the stakeholders and the international travellers arriving to the Netherlands via airport was established, as well as the common goal of the project partners to provide a seamless travel experience by making the interaction with the system into a flow of actions rather than separate ones. This is relevant, because in order to develop user-centred solutions all aspects related to the context should be considered. As explained in chapter one, focusing on the human, societal, business and the technological aspects will most likely provide the best product-service system solutions in terms of usability, desirability, viability and feasibility. The complexity of the Dutch public transportation system paradoxically fosters the system as it provides a countrywide service, but it also proves to be a weakness, as to improve and keep developing it as a whole, change must be applied differently to each of the components. The knowledge on the workings of the system, together with the relevant aspects and patterns regarding international travellers, are the guiding criteria to develop a research method to study how international travellers use the public transportation system and focus on ticket purchase. The method is presented in chapter four.





Rotterdam Meijersplein Station





Interview with travellers in London Paddington Station

### 4.1 Introduction

The previous chapter (The Dutch public transportation system & OV-betalen) provided general contextual knowledge on the Dutch public transportation system and its relation to international travellers arriving at an airport in the Netherlands. In this chapter the research method used to specifically find out how international travellers experience the use of OV-betalen is described. Individual activities carried out during the study in the Netherlands and also the ones conducted during the benchmark study are described. Additionally, it is explained how the gathered data is analyzed.

#### 4.1.1 Aim

Find out how international travellers arriving at an airport in the Netherlands (/benchmark location) use OV-betalen (/corresponding payment system).

#### 4.1.2 Research Questions

The research questions are phrased for both research parts of the study, the one in the Netherlands and the one abroad.

- How do international travellers arriving at an airport in the Netherlands (/benchmark location) use OV-betalen (/corresponding payment system)?
  - o When and where do international travellers interact with OV-betalen (/corresponding payment system)?
  - o How do international travellers interact with the touchpoints of OV-betalen and of the Dutch public transportation system?
  - o What problems do international travellers encounter when interacting with OV-betalen and with the Dutch public transportation system?
- What alternatives do international travellers have regarding their mobility and transportation in the Netherlands(/benchmark location) and why are these selected?
- What is the traveller segmentation amongst international travellers who use OV-betalen?
- What opportunities for improvement are there for the usage of OV-betalen by international travellers?

## 04 - Method

### 4.2 Data Collection

The knowledge gathered in chapter three (The Dutch public transportation system & OV-betalen) is used as the foundation to develop the research method. Consequently, in this study the context of the Dutch public transportation system for international travellers arriving at an airport in the Netherlands is considered the norm and provides the starting point to research the situation for international travellers in the Netherlands and also for international travellers abroad at the respective benchmark locations.

#### 4.2.1 Research Set-up

The research for the project consist of two parts:

1. Local research, in the Netherlands: The goal is to understand the context of the existing situation for international travellers when using public transportation, focusing on ticket purchase.
2. International research, benchmark: Conducting a benchmark provides an overview of the way e-ticketing systems work in different contexts and broadens the perspective about the system and helps to identify processes, products, services and strategies that can lead to improvement. Insights from the benchmark locations can be compared to the Dutch system; while at the same time it highlights which differences in the respective contexts cannot be compared.

The research plan presented below applies to both research parts, as having the same research approach, both locally and internationally, will strengthen the comparison ability of the results.

#### 4.2.2 Field Research Methods

The research carried out is of qualitative nature. Qualitative research "is used in the exploration of meanings of social phenomena as experienced by individuals themselves, in their natural context" (Maletrud, 2001). Hence the experiences of international travellers using OV-betalen (/corresponding payment system) are explored in-depth in the relevant contexts of use. Multiple activities were carried out to explore the situation of international travellers arriving at an airport, who use the public transportation system. Observational research, interviews with users, public transportation personnel and stakeholders and the researcher's first hand experience are the main research methods carried out (Patton, 2002). The locations for data collection are described in chapter 4.3.3.










Type of data	 Notes	 Video Recording	 Audio Recording	 Photos
 Information Retrieving	✓	<input type="checkbox"/>	<input type="checkbox"/>	✓
 Expert Interviews	✓	<input type="checkbox"/>	✓	<input type="checkbox"/>
 User Interviews	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
 Own Experience	✓	✓	<input type="checkbox"/>	✓
 Observations	✓	✓	<input type="checkbox"/>	✓

Figure 17. Qualitative research methods used based on: Qualitative Research & Evaluation Methods (Patton, 2005)

Data Documentation

A wide range of data was gathered in different ways: notes, video recordings, audio recordings and photos. Figure 17 shows a summary of what kind of data is documented in which way. Appendix F presents the interview guidelines for the different types of interviews.

	Types of interviewees		
	International travellers	Public transportation service employees	Stakeholders: company contacts
<b>Interview topics</b>	<ul style="list-style-type: none"> <li>▪ Searching information</li> <li>▪ Choice of transportation modality</li> <li>▪ Ticket purchase</li> <li>▪ Specific issues during contact with public transportation system</li> <li>▪ Positive and negative experiences</li> </ul>	<ul style="list-style-type: none"> <li>▪ Information providing</li> <li>▪ Patterns of use (how international travellers use the system)</li> <li>▪ Specific issues travellers encounter</li> <li>▪ Public transportation system changes</li> <li>▪ Opinion/suggestion for possible improvements to the system</li> </ul>	<ul style="list-style-type: none"> <li>▪ Organizational set-up</li> <li>▪ Relevance: international travellers and public transportation</li> <li>▪ Information provision</li> <li>▪ Ticket sales</li> <li>▪ Strengths and weaknesses of current system/situation</li> </ul>

Figure 18. Types of interviewees and their respective interview topics

### Interviews

International travellers, public transportation service employees and stakeholders were interviewed using an interview guide. A conversational interview was carried out. International travellers and service employees were video recorded if permission by the interviewee was granted. The stakeholder interviews were audio recorded. Figure 18 summarizes the interview topics. Appendix D provides an overview of the role of the interviewed stakeholders and appendix F describes the interview guidelines in detail. Figure 19 shows an interview on site with an international traveller.





**Figure 19.** Interviewing an international traveller at Victoria station in London



**Figure 20.** GoPro camera and harness to record interviews and first hand experience

### **First Hand Experience**

The first hand experience of the researcher provides valuable insight on the researcher's interactions as a user with the products and services of the public transportation system. The personal experience of the researcher within the context of study is valuable in order to assess the system, as it provides a balance between the experiences of the researcher as a user and the researcher's findings about other users. The observations and findings were video recorded, photographed and noted. Keeping in mind the strengths and limitations of this type of participatory research, as well as noting assumptions about the research, before carrying out the research allowed, for a more objective interpretation of findings. Figure 20 shows the harnessed GoPro to record interviewees and first hand experience.

### **Observations**

Observations during field research provided descriptions of people's behaviour, the activities and actions carried out in different situations. Observational research can reveal insights that not necessarily are talked about during an interview, as what people say might vary from how people act (Sanders and Stappers, 2012, p.52-53). During the study people's behaviour and interactions with the public transportation products and services were observed, photographed, video recorded and noted.



## 04 - Method

### 4.2.3 Research Context: Sample Locations

Specific locations to carry out field research were selected. These are referred to as *sample locations* and are based on the established context of use and the defined relevant travel journeys for international travellers arriving at an airport in the Netherlands. The selected locations are key parts of the previously established travel journeys (chapter 3: from home country to Dutch airport, from Dutch airport to city/hotel, within the city and, outside of the city). Public transportation stations and stops are selected to carry out field research, as well as locations specifically relevant for travellers, such as touristic attractions, which usually have a close-by station or stop.

A distinction is made between big stations, small stations and street stops. The number of available modalities was used to classify a station as big or small. The number of transportation modalities for a small station and often for stops is one or two and for a big station usually two or more. Moreover a stop is defined as the place at the street designated for the vehicle (usually a bus or a tram) to stop for passengers to enter and exit the vehicle.

Appendix G provides an overview of the specific sample locations selected for the Netherlands and the benchmark cities/countries (London, Hong Kong and Denmark).

Please note that in London and Hong Kong the research skips the travel journey from city to city, as it is not possible with the respective smart cards. However, regional attractions are part of the research scope. In London and Hong Kong a deeper focus is given to the third travel journey - travel within the city. In Denmark, the public transportation payment system spreads throughout the country and consequentially travelling out side of the city to another city is included in the study scope.

## 4.3 Benchmark Case Selection

### 4.3.1 Relevant Criteria

E-ticketing systems exist in a worldwide range of countries. To select which systems are the most applicable benchmark with the Dutch OV-chipkaart system, inclusion criteria were established:

#### Public transportation system

- **Validity Area** - The OV-chipkaart system is a countrywide system, therefore it was necessary to understand in what geographical area other e-ticketing systems are valid. This is an important context factor affecting the workings of the system, as it affects the way operators work and the way the card is used by the users.

- Modalities of transport - as the Dutch OV-betalen system includes a range of transportation modalities (train, tram, metro, bus) it was relevant to visit countries which offer the same or a similar range of modalities in their public transportation system.

#### **Airport**

- Airport Size - large airports can be better compared to the Schiphol airport and smaller airports can be compared to the Rotterdam - The Hague Airport. In this case the term “big” refers to the number of people arriving at the airport. The larger ones have a greater priority for the project as they are better comparable to Schiphol airport, because 96% (NBTC report, 2014) of international travellers arrive there.
- Distance from the city to the airport - the Schiphol airport is approximately 18km away from the Amsterdam city centre and the Rotterdam - The Hague airport is approximately 8km away from the Rotterdam city centre and 20km away from the Hague city centre. This numbers suggest that the airports in the Netherlands are relatively close to the city and it is interesting to observe, what means of transport are provided in different cities to reach the airport (and vice versa) specially if they are relatively close, like in the Netherlands.

#### **Tourism**

- Number of tourists – it is relevant to consider how different cultures adapt to the growing number of tourists. It is assumed that cities with more tourists will have systems that are more tourist-friendly than cities that have not come across the need of providing international services. In particular it is relevant to compare the way information is provided and the way the service is offered to international travellers, who do not know the system like regular travellers.

#### **4.3.2 Case Selection: London, Hong Kong and Denmark**

A list of cities suggested by the project partners and further cities considered relevant using the criteria was established through an online research. The table in appendix H shows an overview of the initially considered locations (and the selected locations).

The selected benchmark locations are London, Hong Kong and Denmark. In Denmark the system is available country wide, just like in the Netherlands, therefore the focus not only is set on Copenhagen, but the country as a whole. This means, insights can be compared to the Dutch system more easily. In London and in Hong Kong the electronic public transportation payment system is only valid within one city, however these cities remain very relevant to the study due to the successful implementation of

## 04 - Method

their electronic payment systems. Furthermore, London and Hong Kong are geographically large cities and within the top ten most visited cities by international travellers world-wide (Forbes.com, February 2016). Additionally, both have an international airport, which also is within the top ten of most frequented airports by international travellers, like is the Amsterdam Schiphol Airport (Airports Council International, July 2015). The Copenhagen Airport ranks on first place in Europe with regards to ground transportation and Schiphol airport on second place. (Airport Service Quality, August 2015) A brief description of these locations is provided in the following segment. A deeper portrayal of each location's context can be found in chapter 7.

### London

The electronic payment system in London is the Oyster card system, see figure 21 (left). London's public transportation system is ran by one public transportation operator, namely Transport for London (TfL), which provides the metro system (London Underground also known as "the tube") and bus services. TfL shares some of London's stations with multiple national rail companies. London has several airports, however the London Heathrow Airport ranks in 3rd place world wide in regards to having the most international traveller traffic (Airports Council International, July 2015) although it is approximately 32 km away from the London city centre. Moreover, London is the second most visited city worldwide after Bangkok (Forbes.com, February 2016).

### Hong Kong

The Octopus card (figure 21, centre) is the electronic payment system for Hong Kong's public transportation system, and has added function within several other commercial sectors, for example to pay in retail. Hong Kong has several transportation operators including bus companies and ferry companies, however during this study the focus is on the MTRCL (Mass Transit Railway Corporation Limited) system, which includes the metro system, the light rail, the Airport Express train, other trains (like intercity railway services) and the MTR bus. Hong Kong International Airport ranks in second place in regards to international passenger traffic (Airports Council International, July 2015). The Airport Express train connects the airport with Hong Kong city, which also are approximately 35 km apart within 24 minutes. Furthermore, Hong Kong is on the 9th place of the top-ten most visited cities in the world (Forbes.com, February 2016).

### Denmark

The Danish public transportation system operates with one electronic payment system country-wide, namely Rejsekort, see figure 21 (right). Nine companies set the system up when they decided to renew the previous paper system, which was wearing out. In Denmark the DSB (Danske Statsbaner or Danish State Railways) runs the trains that provide service for both long and short distances and multiple bus companies provide access to all sorts of cities and regions. Also, there is the Copenhagen Metro, which is rather small (currently only two lines, more are being built and developed), but quite profitable. In Europe the Copenhagen Airport ranks on first place in ground transportation and Schiphol airport on second place (Airport Service Quality, August 2015), making a comparison of the situation very relevant for this study. The airport is approximately 7,5 km away from the city centre, in comparison to the other selected cities it is rather close, similar to the Dutch airports to the corresponding main cities (Schiphol Airport 18km and Rotterdam - The Hague Airport 8km).



Figure 21. London: Oyster card (left), Hong Kong: Octopus card (centre), Denmark: Rejsekort (right)

## 04 - Method

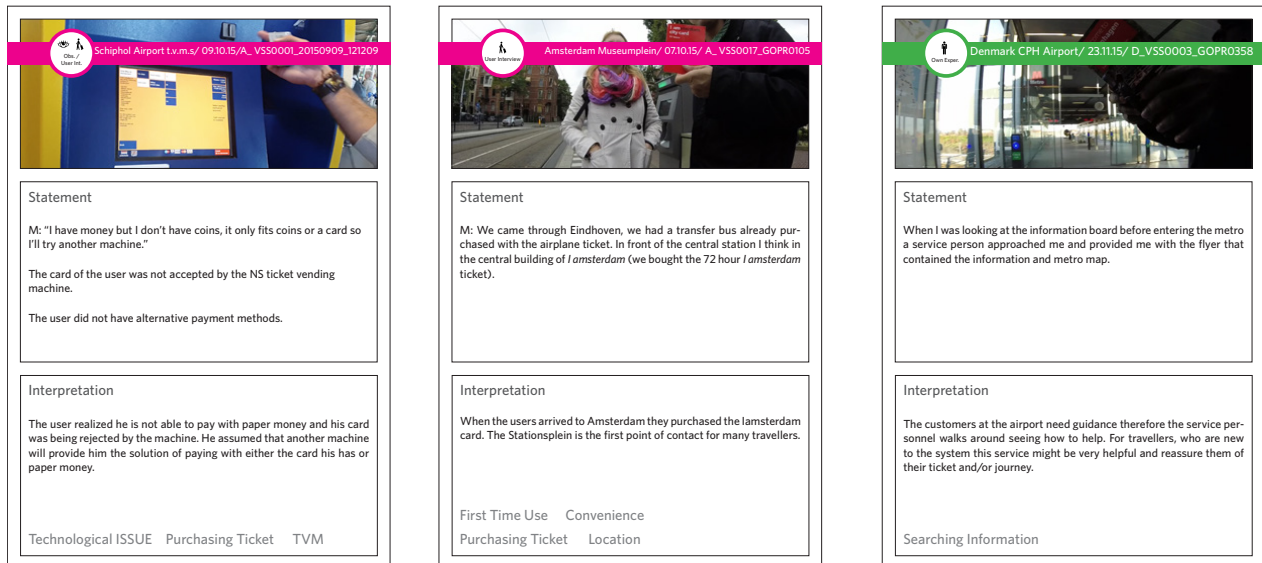


Figure 22. Examples of statement cards

### 4.4 Data Analysis

To analyze the use of the OV-chipkaart by international travellers in the Netherlands and compare the Dutch situation with the selected benchmark locations, the diverse data must be structured to communicate the wide-ranging results. The findings were compared to each other in the form of statement cards (Sanders, E. B.-N., & Stappers, P. J, 2012), which means that raw data was visualized in a format that contains images, video screen shorts, observational statements, expert, user and personnel interview quotes and own experiences in the form of statements (when applicable raw data) and interpretations of the statements, see figure 22. These cards provide a standardized representation of the findings and like this can be more straightforwardly compared and/or clustered. Four steps were taken during the analysis process. The first step consisted of establishing the travel phases and respective steps for the customer journey. The second step was to establish what types of traveller groups exist. After that the problem areas for the Dutch system were described per phase and per type of traveller and finally the situation in the Netherlands was compared with the international cases. The following segments explain each of these steps.

#### 4.4.1 Travel Phases & Steps

The current situation of international travellers arriving at an airport in the Netherlands, who also use the public transportation system, is to be communicated through a customer journey. The customer journey is created with the purpose of being a communication tool to develop user-centred touchpoint concepts, that together illustrate the possible usability improvements. Thus, the first step is to use the gathered data to establish the phases of use that international travellers go through when using public transportation. These phases form the base of the customer journey. The insights from the statement cards are used to label the steps of the customer journey that international travellers arriving via airports experience. The customer journey created by Joppien, Niks and Niermeijer (2013) is used as a reference to create the travel phases.

#### 4.4.2 Traveller Segmentation

The different types of travellers amongst international travellers arriving via airport must be distinguished in order to depict how the phases of use in the customer journey take place for different types of travellers. A segmentation of travellers is classified with the study findings. Based on the segmentation personas are created. Personas are fictional characters that represent the user group and help to describe the situation of use based on their specific characteristics and usage of the products (or service). (usability.gov, n.d.)

#### 4.4.3 Problem Areas of the Dutch system

The situation for the different types of international travellers arriving via airport in the Netherlands was mapped in the customer journey. Each persona was assigned a journey and the journeys were used to assess the existing touchpoints travellers come across. The sum of the different journeys illustrate the most relevant touchpoints for international travellers and how during the phases of use the different touchpoints can have a more positive or more negative impact on the different types of travellers. The touchpoints with the most negative impact are listed, as these are the ones, which potentially can be redesigned and developed in a more user-centred way to possibly improve the whole journey of international travellers using public transportation in the Netherlands.

#### 4.4.4 Cross-case analysis

The benchmark helps to identify processes, products services and strategies that can lead to improvement in the Netherlands. However, the research results from the Netherlands cannot be compared one to one with the results from London, Hong Kong and Denmark, due to the distinct contexts of the public transportation systems. It is specifically hard to compare the touchpoints, as for each country they are very concrete. Therefore, the cross-case analysis was conducted at a more abstract level, that provides an overview of the journey and the relevant aspects of international travellers travels, in regards of their use of public transportation in the different locations.

## 04 - Method

To do this, the statement cards (Sanders, E. B.-N., & Stappers, P. J, 2012) organized by country/city (the Netherlands, London, Hong Kong, Denmark) were created. The cards then were clustered into topics and subtopics. The clustering initially happened in an independent manner and afterwards with fellow students to gain different perspectives.

After clustering the statement cards five main topics relevant to international travellers experiences using public transportation surfaced. The five topics are:

1. Choice of transportation
2. Searching information
3. Ticket selection
4. Ticket purchase at ticket vending machine
5. Public transportation usage

Figure 23 shows each of these five topics, their subtopics and their division into properties. A more extensive description of the topics is provided in appendix I. The cross case analysis of the Netherlands and the benchmark locations was executed using these topics as comparative parameters in chapter 7.

This chapter specified the methods to research the field and analyze the gathered data. The following chapter presents the general findings of the research.

Topic	Subtopic	Property
<b>1. Choice of transportation</b>	Selection by convenience factor	Accessibility
		Comfort
		Distance
		Efficiency
	Selection based on experience	Failed attempt to use public transportation
		Public transportation assumption or bias
<b>2. Searching Information</b>	Service Personnel	Type of information requested
		Way of providing information
		Location of assistance
		User assumption "asking the service personnel is best"
	Public transportation signage	Unclear signage
		Signage style
		Signage location
		Amount of information
	Spatial orientation	Google Maps & smartphone usage
		Public transportation maps
		Mental state
	Language problems	Confusion between modality types
		English insufficiency at touchpoints
<b>3. Ticket selection</b>	Reason	Length of stay
		Price
		Extra benefits
	Other influencing selection factors	"Non-selection": Visiting friends/family
		Selection through service personnel advice
		Operator complexity/compatibility of tickets:
		Moment/ Location of Journey
		Selection based on previous knowledge
		Selection without previous knowledge
<b>4. Ticket purchase at ticket vending machine</b>	TVM Interface	Ticket names/information or benefits not clear
		(Unclear) use cues
	Payment method	Bank/credit card declined
		In cash, only coin payment available
		OV-chipkaart/ bankcard reader location
	Ticket vending machine - technological Issues	
<b>5. Public transportation usage</b>	First time use	Lack of usage information
		Feedforward
	Technological issue	Gates

Figure 23. Topics, subtopics and properties to analyze data for the cross-case analysis





↓ TRAIN INFO TOURIST INFO →



5

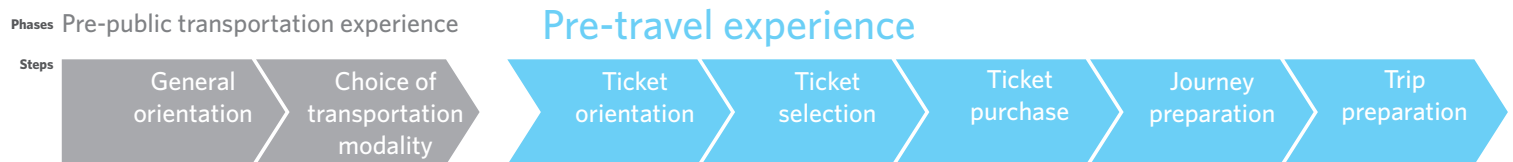
Rotterdam Central Station train and tourist information desk

## General findings: travel phases & traveller types - 05

### 5.1 Introduction

This chapter communicates the findings related to the research question regarding, when and where international travellers interact with the OV-betalen system. Travel phases international travellers go through when using public transportation are established and furthermore a definition of the traveller segmentation within the group of international travellers is established. One single definition for what it means to travel does not exist; the verb travel can have multiple definitions, depending on the context it is used for. Consequently, neither does one type of traveller exist, nor one single way of using public transportation. Therefore, the phases of public transportation usage are defined and broken down into steps that convey the possible stages travellers go through when using public transportation. How international travellers experience using public transportation manifests throughout these travel phases, can be better explained by understanding the types of travellers there are. The types of travellers identified during the study are exemplified with personas (definition p.9 & chapter 4.4.2), that represent the diversity of reasons and ways that travellers come in contact with OV-betalen. They provide examples for the different locations and touchpoints they use. The overview of experiences are represented in the customer journey for international travellers in the Netherlands, which is described in depth in chapter 6.

## 05 - General findings: travel phases & traveller types



### 5.2 Customer Journey: Travel Phases & Steps

Purchasing a public transportation ticket implies taking into account several considerations and results in different choices for different travellers, depending on their travel purposes. These are things like selecting the best route, selecting the most suitable type of transportation modality, selecting a ticket based on the length of the stay or on a price and benefit comparison, amongst other options. The field research in the Netherlands and abroad has provided insight on these matters. In order to structure and communicate the information travel phases that international travellers go through when using public transportation, are defined.

Four main phases of use (see figure 24), are described to define travellers' usage of public transportation, namely pre-public transportation experience, pre-travel experience, travel experience and post-travel experience. Each of these phases is split into steps that explain the usage actions that can be taken per phase. The phases of travel happen in a chronological manner, however some of the single steps per phase might happen in different orders for different travellers, especially in the pre-travel experience phase.

#### 5.2.1 Phase 1: Pre-public transportation experience

- General orientation: Travellers orientate themselves at a high level, regarding their travel to a city/country abroad; this step can include searching for activities, locations and in a general aspect transportation.
- Chose the type of transportation modality: Travellers chose the transportation modality they want to use. This step can refer to the first trip (being from the airport to their next destination), but also is of relevance when the travellers already are in the city/country and is in the need of using a way of transport.

#### Schiphol airport

**"Yeah, we googled transportation and then we also googled - like we were looking at tourist attractions and then we came across the I amsterdam card and it had all of them included so we were like, we can just buy that and we are sorted for the weekend." - Male (with partner), age: 20 -30, UK,**

## Travel experience



## Post-travel experience



Figure 24. Travel phases and steps

### 5.2.2 Phase 2: Pre-travel experience

This phase includes all the steps after the traveller has decided to use public transportation. These steps might happen in different orders depending on the situation of use, but must all take place for the traveller to be able to travel with a public transportation modality.

- Ticket orientation: When the travellers inform themselves about the ticket options available;
- Ticket selection: When the travellers have specifically chosen a ticket they find most convenient for their travels.
- Ticket purchase: The actual moment of payment for the ticket.
- Journey preparation: When the travellers prepare the upcoming journey by informing themselves about the routes and times available.
- Trip preparation: Refers to the travellers situation to find the right modality, line and direction of their trip.

At ticket vending machine, Schiphol airport

**"First...I want to go tooo "Amsterdam", ehh "Second Class", second class ok. Select "Valid Today" and "2". Maestro, Visa. I can expect I don't have it (looks in wallet. Lets try this (pulls a card out and looks at paypad and machine, then inserts card and presses "Visa" option). Visa (Presses "Follow the instructions on the paypad" multiple times and moves to interact with paypad). We got two tickets for the city for this day, for today. "Single use cards are being, two single use cards, it might take a while" (one ticket comes out) OK." - Male (with partner), age: 30 - 40, Turkey**



## 05 - General findings: travel phases and traveller types

### 5.2.3 Phase 3: Travel experience

The steps that travellers take while on a trip.

- Entering the paid area: Refers to the moment of ticket validation – explicitly check-in.
- Travelling: Refers to the time spent in the vehicle.
- Interchanging: Switching between lines or even modalities within a journey.
- Exiting the paid area: Refers to the moment of ticket validation – explicitly check-out.

Hong Kong, Ngong Ping

**"And even the connectivity everywhere, like because we need changing lines in between – it's fabulous. We have one map and you can just know it all. It is I think very, very convenient and if you can read a map you can easily know what to do. And you won't get lost."** – Male (with family), 40-50, India

### 5.2.4 Phase 4: Post-travel experience

The steps related to the moments after the travel journey

- Leaving the public transportation system: Includes exiting the actual modality/station or stop.
- Reflection: Travellers thoughts about the travel experience, which can happen recurrently and at different moments in time (directly after the use, a day after the use, when back at home, etc.)

London, British Museum

**"(The transportation system) I think is absolutely great. We have not had to wait for more than four minutes for the underground train,."** – Male (with friend), age: 20-30, Spain,

### 5.3 Traveller Segmentation

How the international travellers' experience, using public transportation, manifests itself throughout the previously established travel phases, can be better explained by understanding the types of travellers there are. People travel for different reasons and with different means and purposes. Throughout the research it became evident, that clustering travellers into traveller types helps to explain the different purposes travellers have and the relationship the travellers have with public transportation within different context and when in contact with different touchpoints.

Four different groups of international travellers are created after interviewing approximately 100 (often accompanied) travellers in the Netherlands, London, Hong Kong and Denmark (full overview in appendix J). The aspects considered to create the personas are directly related to the relevant patterns found regarding traveller's experiences during the field study (purpose of travel, type of trip, length of stay, number of companions, most relevant aspect of travel experience and most relevant aspect in regards of public transportation usage). The four groups are the following:

- 1. Spontaneous travellers:** Use public transportation incidentally.
- 2. Efficient travellers:** Have a plan for their stay and select the best options in terms of tickets and activities or a combination of both.
- 3. Purpose travellers:** Have a specific destination and usually have to go to that destination and immediately travel back.
- 4. All-set travellers:** Are visiting friends and family, so they use public transportation, but are supplied with tickets and information by their hosts.

To describe the Dutch situation more in depth per travel segment, personas are created. Personas are constructed characters based on user research findings and insights from the field research. For every persona a travel journey and corresponding travel experience are described (appendix K) Representing interaction scenarios for different types of traveller not only provide an overview of the strengths and weaknesses of the system, but also clarifies the wide range of possible use-cases, which the system should be aware of during future developments of the system.

## 05 - General findings: travel phases and traveller types

### 5.3.1 Spontaneous Travellers

These travellers usually have not informed themselves upfront about the public transportation possibilities they have at the place they are visiting. It might be that they do not have a plan for their stay, they will carry out activities that they come across when they are already in the city/place they are visiting. These travellers walk through the city and spontaneously decide where to go or what to do. The relationship these travellers have with public transportation is of incidental nature, meaning that on the spot they decide to use public transportation to get from A to B.

- No previous public transportation information.
- No or vague plan for their stay.
- Walk through the city and spontaneously decide where to go or what to do.
- Only use public transportation incidentally.

#### Amsterdam Stationsplein

**"I'm just here for a day. No I didn't get a ticket. I might if I need one, but I haven't got a reason yet."**  
- Female (alone), age: 20-30, South Korea

#### Schiphol airport

**"No, we did not (inform ourselves about public transportation before coming). My wife, she made the reservation and then we just landed and we are trying to find it."** - Male (with partner), age: 30-40, Turkey

### Persona A



**SPONTANEOUS TRAVELLER**



**SAM, 28**

**Computer Scientist  
Australia  
Single**

Travel Purpose: **Interchange flight/tourism**

Type of trip: **Part of a longer trip**

Length of stay: **8 hours**

Number of companions: **0, travels alone**

**I want to visit the city centre, grab something to eat and head back to catch my flight.**

**I just need a ticket to get to the city and back as quickly as possible.**

### Persona B



**SPONTANEOUS TRAVELLER**



**JONAS, 22**

**Student  
Germany  
Single**

Travel Purpose: **Tourism**

Type of trip: **Only trip**

Length of stay: **3 days**

Number of companions: **1, travels with friend**

**We don't really have a plan, we just want to experience fun things.**

**I'm not even sure if we need public transportation... if we do, then we will buy the ticket at that moment.**



## 05 - General findings: travel phases and traveller types

### 5.3.2 Efficient Travellers

These travellers know they have limited time to get to know the city/place and therefore create a plan with priorities, which covers as much as possible in terms of sight seeing and activities that can be carried out within the time span of their stay. As they want to get from A to B as efficiently as possible, they do inform themselves about their public transportation or other mobility possibilities. Often the best way to achieve their goal of carrying out as many activities as possible, is through purchasing tickets with extra benefits, for example, the ones that include the tickets for attractions.

- Have a plan for the stay, often the plan is to see as many attractions as possible in a specific time frame.
- Check the best options in terms of tickets and activities or a combination of both, either before the trip online or in a travel guide or upon arrival.
- A comparison between price, length of stay and ticket benefits is part of these travellers ticket selection process.

#### Amsterdam Stationsplein

**"(I bought an) OV-card, yes because I will stay here for 5 days and then I bought the OV-card and a top of 50 Euros in it so I can just use it to go somewhere. (I found it) on the internet."** - Female (with friend), age: 20 -30, Taiwan

Persona C



**EFFICIENT TRAVELLER**



**PÉTER, 36**

**Chef  
Hungary  
Married**

Travel Purpose: **Tourism**

Type of trip: **Only trip**

Length of stay: **3 days, weekend trip**

Number of companions: **1, travels with wife**

We would like to get to know the city and see the main attractions.

**I would like to have a ticket that I can use through the whole stay so that we don't have to worry about buying tickets any more.**

Persona D



**EFFICIENT TRAVELLER**



**GEORGE, 66**

**Retired Commercial RS MGR  
Canada  
Married**

Travel Purpose: **Tourism**

Type of trip: **Part of a longer trip (agency)**

Length of stay: **4 days**

Number of companions: **1, with wife (in group)**

We enjoy seeing nice places, having good food, just a nice time.

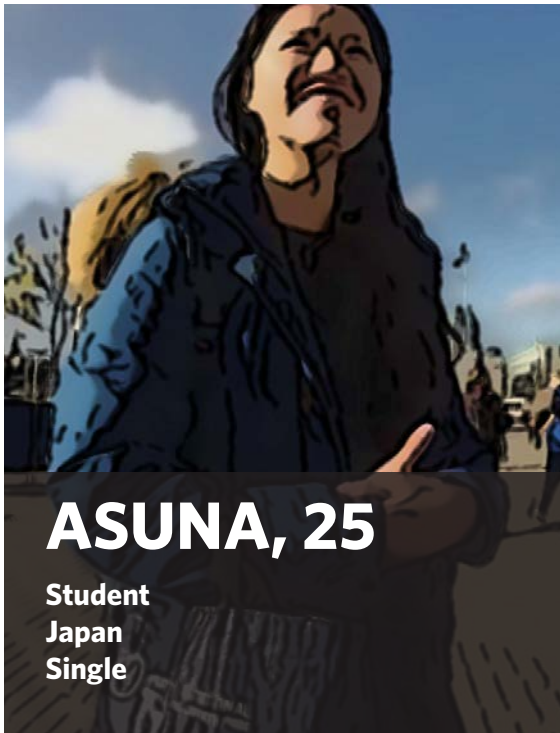
**Our trip is arranged by an agency so most tours are arranged for, but we might want to go to \*specific location\* so we will need tickets to get there and back.**

## 05 - General findings: travel phases and traveller types

### Persona E



#### EFFICIENT TRAVELLER



**ASUNA, 25**

**Student  
Japan  
Single**

Travel Purpose: **Tourism**

Type of trip: **Part of a longer trip**

Length of stay: **2 days**

Number of companions: **2, travels with friends**

I really want to go to \*specific location\* and see the city,  
but we are only here for two days so...

**I found a ticket that offers discounts to attractions  
so I think it is the most convenient.**





Rotterdam Central Station: NS ticket vending machines



## 05 - General findings: travel phases and traveller types

### 5.3.3 Purpose Travellers

These travellers have to go from one place to another and usually return within a certain period of time. These travellers do not inform themselves previously about ticket options they have, but assume that public transportation will provide them a possibility to get to their destination efficiently. If the public transportation system fails to offer what they need, they might be very distressed, as they have to get to their destination quickly. If public transportation does not offer an efficient solution, these travellers will find the efficient solution they need, often the price is not of importance in their case.

- Have a specific destination; usually have to go to that destination and back.

Hong Kong, Ngong Ping

**"I think I just looked up...It said that if you are going to do more than x amount you should get an Octopus card, but I was only taking one seven dollar one. Really I will only take two rides with it, so no I don't think so..."** – Male (alone), age: 30-40, USA

Persona F



PURPOSE TRAVELLER



**MARIE, 43**

Financial Advisor  
France  
Married

Travel Purpose: **Business**

Type of trip: **Only trip**

Length of stay: **12 hours**

Number of companions: **0, travels alone**

My flight was a bit delayed so I have to get to my meeting as soon as possible.

**I need a return ticket to get there now and back to the airport later.**

## 05 - General findings: travel phases and traveller types

### 5.3.4 All-set Travellers

These travellers use public transportation at the city/place they are visiting, however have little to no contact with the public transportation touchpoints, because someone they are visiting, who knows the system, is taking care of purchasing their tickets, showing them how to use the tickets and showing them the way.

- Usually visiting friends and family.
- Use public transportation, however are supplied with tickets and information by their companion.

#### Rotterdam Museumpark

**"I have a few spare cards for family when they come so they can you know move around the city when their own card - the one not personal you know, the one you can charge all the time. That is why she was checking because she put money every time she comes here."** - Female (with mother), age: 30-40, Italy

#### Denmark - Copenhagen, Little Mermaid

**"A: Yeah she gave me one so I could use it.  
B: I just gave her one of the Rejeskorts I had."** - Female(friends), age 20 -30, USA



Persona G



SET TRAVELLER



**GIULIA, 18**

High School Graduate  
Italy  
Single

Travel Purpose: **Tourism**

Type of trip: **Only trip**

Length of stay: **2 days**

Number of companions: **0, visits friend**

I want to see my friend Laura and it is a great opportunity for me to go to \*specific city\*.

I don't know what kind of ticket I need, but Laura knows.

Persona H



SET TRAVELLER



**CATHY, 38**

Teacher  
USA  
Married

Travel Purpose: **Tourism**

Type of trip: **Only trip**

Length of stay: **7 days**

Number of companions: **4, family visits aunt**

We are so happy to visit my sister, their aunty Rachel, and show the kids other cultures.

Rachel gave me these cards, so when we need them we will use them. She said we might have to reload them depending on how much money we spend, Gary knows how now.

## 05 - General findings: travel phases and traveller types

### 5.4 Conclusions

Multiple ways to interact with public transportation exist, due to the fact that travellers travel for different reasons in different contexts and use different touchpoints. The field research for the Dutch context, as well as the field research for the contexts of London, Hong Kong and Denmark provided an overview of these different use situations.

Four main travel phases were established (pre-public transportation experience, pre-travel experience, travel experience and post-travel experience) and each of these consists of multiple steps travellers take when interacting with public transportation. Furthermore, four types of traveller groups are recognized (spontaneous travellers, efficient travellers, purpose travellers and all-set travellers) and exemplified with personas for the Dutch situation, to illustrate the diversity in current use-scenarios through the travel phases.

The travel journey of international travellers in the Netherlands at the moment is not seamless. Travellers must go through all of these phases and steps, from the moment they decide to travel to the moment they leave the system to use public transportation. Because travellers go through the steps using different touchpoints in different contexts, as multiple parties are responsible to provide the means to interact with public transportation in the different phases, there is no right or best way to use and the experience the system. These travel phases and steps show that purchasing a ticket actually cannot be treated as an individual action, but that the whole travel journey and experience of international travellers must be considered to create a seamless experience. In order to improve OV-betaling for international travellers, the diversity of use cases and the different combinations of touchpoints and locations should be incorporated into the solution. Moreover, multiple solutions for different types of travellers must be developed.

The following chapter summarizes the current experiences of international travellers in the Netherlands through the main travel phases and provides an in depth description of the customer journey for international travellers in the Netherlands.





Travellers at the bus station in Amsterdam Central Station





Travellers at the metro gate line in Amsterdam Zuid Station

## Usage of OV-betalen by international travellers - 06

### 6.1 Introduction

In the previous chapter the main travel phases (pre-public transportation experience, pre-travel experience, travel experience and post-travel experience) and the respective steps per phase that international travellers go through, when using the services of public transportation were established. Furthermore, four different types of travellers were identified and it was explained that travellers go through the travel phases and steps in different contexts that involve different touchpoints.

This chapter describes the usage patterns of OV-betalen by international travellers arriving at an airport in the Netherlands in each of the previously established travel phases and steps. It is relevant to understand these patterns, as they provide insight on how people travel and what they do when they travel, because they provide structure to develop solutions in the design phase. Furthermore, for each of the travel steps the issues with the system (composed by strengths and weaknesses) in terms of usage and interaction with the multiple touchpoints are assessed. These issues are relevant, because they point towards the things that need improvement.

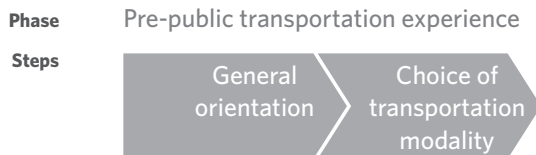
The assessment is based on the qualitative data (interviews, observations, empirical research) gathered during the field research. Multiple scenarios are created for the respective personas and the weaknesses and problems are exemplified with specific use cases, in order to provide a realistic context of use, when each of the weaknesses or problems occur.

### 6.2 Customer Journey: Assessment of current experiences by travel phase

This chapter presents each travel phase separately. The use goal and expectations per step within a travel phase are presented. The patterns of use are described and the issues of the system (strengths and weakness) are assessed from the users perspectives. Emphasis is given to the touchpoint problems, as the goal is to improve the system. Thus, the current weaknesses must be clear. However, the strengths of the system are defined, because they should be considered and kept, when developing solutions for improvement. Finally, the whole travel experience is summarized in the customer journey. Some of the steps have specific descriptions regarding the way certain types of travellers experience it, however not for all step data is available to specify the situation for the types of travellers.

## 06 - Usage of OV-betalen by international travellers

### 6.2.1 Pre-public transportation experience



#### General orientation

##### *Goal*

To find information about the travel destination. In some cases the travellers already search for information about public transportation at that destination.

##### *Expectation*

Sources of information about the travel destination are available in different sorts of media (such as travel guides or travel websites and blogs), as well as on official websites of the respective countries/city and companies.

##### *Patterns of use*

Often the general orientation step takes place at home, people research in order to book their flights and hotels. As discussed in chapter 3.4 the NBTC inbound tourism report (2014) states that 87% of travellers with the destination Netherlands use the Internet as their main source of information, and that the most searched and booked things are accommodation providers, attractions and museums, carriers, cities and regions and travel organizations. Many sources including travel guides, websites, blogs, apps, media and word of mouth were found. Some of these sources are provided by the official service providers (like the cities/countries tourism boards or organization or the public transportation companies). Interviewees sometimes indicated that travel guides are used both before the trip to the Netherlands to search for information, as well as while in the Netherlands and that these influence what travellers do in terms of activities and the (public) transportation they select to get to these activities.

##### *Issues*

- + If travellers engage themselves to search for information, they will find enough information from different sources.
- The large amount of sources can result in the risk of information overload for the travellers, who lose the overview of their possibilities.
- Some of the information available is not official and might contain misleading information or even outdated information, that, for example, discusses the Strippenkaart, a ticket that doesn't exist since a few years anymore.



Hence, it is a positive aspect to have multiple sources to obtain information, however the information should give a sense of transparency in order for the traveller to make the best choice for his travel. If the travellers are provided with a clear overview of options, the selection and purchase process of transportation tickets can be more efficient, possibly benefiting both the user and possibly the businesses.

#### Amsterdam Westermarkt

**"Yeah (I knew this ticket exists and found out) in tripadvisor, on the internet it is very useful. I got this one (an Amsterdam travel guide)."** - Female (with daughter), age: 50-60, Germany

#### Choice of transportation modality

##### *Goal*

To search for the multiple transportation possibilities available and compare the benefits of each and weigh out what is more important and more convenient for the traveller's personal situation. Make the decision of what type of transportation to use when at the travel destination.

##### *Expectation*

The information available will guide the travellers to select the most convenient option.

#### Schiphol airport

**"That (using public transportation) depends on where I need to get to, so I use a mix of public transportation or rent a car. The difference, it mainly depends on the destination, like if I need to get to an industrial area, because I need to visit a client there it is difficult to get the quickly with public transport so the car is more comfortable, it is quicker, but it is more expensive. Public transport is cheaper but slower. Today I actually am going to take a taxi, it is because the place where I need to go is close by the airport so getting a rental car would be more expensive and getting a bus is way to uncomfortable so I am going to get a taxi."** - Female (alone), 30 - 40, Belgium

##### *Patterns of use*

It seems to be a regular pattern that the decision to choose a specific transportation modality by international travellers is based on convenience, which is evaluated through accessibility, comfort, distance and efficiency. Interviews revealed that these aspects often are assessed in regards to each other.

- Accessibility refers to the reachability of locations (at all times) and the frequency of public transportation.
- Comfort refers to perceived well being within a certain modality, like for example cleanliness but also having sufficient space for luggage.
- Distance from A to B, it was weighed out especially on close distances, as some people prefer to walk when their destination is close or prefer to take a car when their destination is far.

## 06 - Usage of OV-betalen by international travellers

- Efficiency refers to the actual time of travel, the quickest transportation modality/route is the most efficient.

As mentioned in the previous section, several interviewees, categorized as efficient travellers, explained that they choose their transportation through online sources when researching the activities for their stay or if they research how they will get from the airport to their hotel. More spontaneous travellers might access online information just moments before their journey, for example, on their smartphone or at a street stop. Purpose travellers, like business people, who were interviewed clarified, that they will often decide what transportation modality to use depending on the circumstance, if their flight was delayed and they have to get to the meeting as soon as possible, they decide what is the most efficient way to get there. Figure 25 and Figure 26 illustrate different ways public transportation information is provided at Schiphol airport.

Nonetheless, during the moment of use not all travellers have data access (wifi, 3G or 4G) available or the option to access online information, therefore all types of travellers rely on information upon the location at the moment of use, like upon arrival at the airport. It was observed that information on location usually is available in the form of brochures, screens, posters and maps.

### *Issues*

- + When travellers have the possibility to guide themselves through online sources to decide what transportation modality to use, it helps them to select their preferred option before arrival with the potential to make their trip more straightforward because they already have the knowledge they need to select a transportation modality or route of travel.
- A lack of information (when information is not found or not available) or information overload (when there are multiple sources online as well as different types of sources from different companies at the airport, stations and stops) lead to a lack of transparency and can influence the way the different types of travellers make their decisions and decide what is the most convenient option for them, both at home or at the moment of use.

When a clear overview of the possibilities available and the benefits are not evident to the travellers, it was found that they often base their decision on previous experience or on assumptions. In some cases, when public transportation is selected as the preferred transportation option, the selected ticket is valid for the whole stay. Hence, that moment is crucial for the travellers, as it will determine the transportation for the rest of their trip.



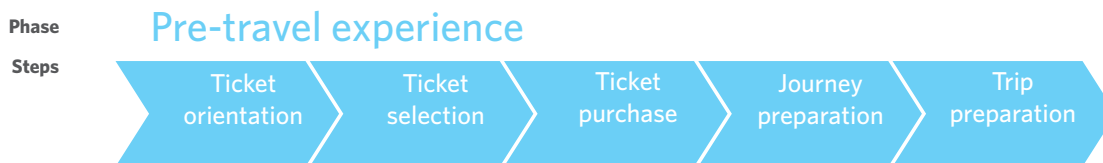
Figure 25. Train information at Schiphol airport on screens, signs and posters



Figure 26. Bus information and ticket sale at Schiphol airport

## 06 - Usage of OV-betalen by international travellers

### 6.2.2 Pre-travel experience



#### **Ticket orientation**

##### *Goal*

Search for information about the types of tickets at their destination, compare them and weigh out the differences between tickets, depending on the travel purpose and travellers' preferences.

##### *Expectation*

The touchpoints such as public transportation websites, service personnel and brochures will have clear information regarding the ticket options available.

##### *Patterns of use*

Efficient travellers often inform themselves previously about their travels at home, in order to be prepared on arrival. As mentioned in the previous sections, when travellers search for ticket options online there is a large amount of sources available, that can have a negative effect on the travellers, due to information overload and lack of transparency. Nonetheless, when the travellers succeed at informing themselves online the next steps (ticket selection and ticket purchase) often take place more efficiently and the travellers interact with available touchpoints in a more straightforward way.

In general it was found that travellers inform themselves about the ticket options within a wide range of contexts, like the airport, stations and their hotels. This can happen at ticket vending machines, as well as with service personnel, or through available brochures and posters, see figures 27 and 28. For more spontaneous travellers this step can even take place on the transportation vehicles, when they ask the bus or tram conductor. It was observed and explained by interviewed personnel that travellers often request advice from service personnel to figure out what sorts of tickets are available.

##### *Issues*

- At ticket vending machines ticket orientation often is problematic for international travellers because they do not understand what the different ticket names mean, nor can they independently search for information regarding the benefits of the ticket options.
- + Interviews with travellers demonstrate that the help from the service personnel can be

perceived as helpful if the personnel clearly explains the options available and advises the travellers in terms of their situation.

- Some interviews revealed that the information provided by the service personnel can also be perceived as very negative if the travellers come to believe that the personnel did not provide the best ticket option.

Often the names of the tickets are not clear to international travelers and information explaining what the tickets actually mean is not easily available at the moment of purchase, for example, at a ticket vending machine. Travellers often recur to service personnel for help when in doubt, however, the information provided by service personnel in regards of ticket options has proven to be inconsistent, as some travellers have positive experiences and some negative experiences.

Rotterdam airport

**"I don't know what the differences between any of these are. Yes, like "Purchase Anonymous Chipcard" or "Purchase Disposable"...I don't know the difference. I don't know."** – Female (alone), age: 20-30, USA

Amsterdam Stationsplein

**"Nothing has been explained about what ticket you need for which area and we have travelled a couple of weeks, we have been in lots of different cities and everyone always explains "what you need the ticket for" "where are you going" and they can tell which are the better ones. Yesterday we just got given a ticket and we couldn't even use it."** – Female (with partner), age: 20 – 30, UK

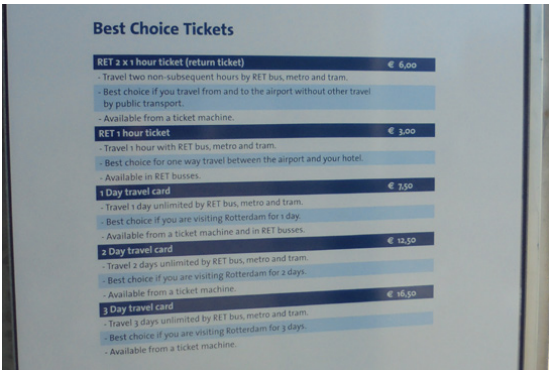


Figure 27. Rotterdam Airport ticket information list at bus stop



Figure 28. RET ticket vending machine: ticket selection and payment menu

## 06 - Usage of OV-betalen by international travellers

### **Ticket Selection**

#### *Goal*

To choose a ticket for the whole trip in the Netherlands or for their next travel journey (from A to B).

#### *Expectation*

A clear overview of tickets and their benefits.

#### *Patterns of use*

Similarly to ticket orientation, it was found that ticket selection happens at a range of contexts, like the airport, stations, hotels and in the vehicle of the transportation operators. Travellers use different touchpoints, like, online sources, ticket vending machines or service desks. It became evident from interviews that travellers select their tickets depending on the length of their stay in the Netherlands the price of the ticket and often because the ticket offers extra benefits, like discounts to attractions.

Only once an international traveller, who purchased the Anonymous OV-chipkaart was encountered in the Netherlands. Service personnel from diverse companies and also hotels explained in interviews that they do not recommend the OV-chipkaart due to the price and lack of convenience for travellers, who are usually in the Netherlands for only a few days. Other forms of OV-betalen, especially Disposable OV-chipkaart, often single journey tickets, are the most common amongst international travellers. The OV-chipkaart is not normally used by international travellers.

#### *Issues*

- The provision of too many tickets leads to confusion.
- The presence of multiple types of operators has a negative effect on the experience of travellers, who must purchase several tickets or purchase the wrong tickets, due to a lack of knowledge about what tickets are for what operators. In the Netherlands this is a problem especially when the purchased tickets are not available for multiple transport operators. When travellers have purchased a specific ticket and they find out that they must purchase further tickets for the different operator they are not pleased, but if they do not know and use a wrong ticket they even run the risk of being fined.
- + Interviews revealed that tickets that offer transportation for several days are perceived as convenient. Especially tickets that offer extra benefits, like discounts and free entrances to attractions, usually are please the travellers greatly.



When there are gaps in the (ticket) orientation phase, meaning that the information provided is not clear enough or insufficient, travellers tend to select tickets that are not the most convenient and in hindsight are disappointed with the service. The large range of tickets available per operator creates a lack of transparency and can lead to the purchase of wrong tickets (invalid for the area the travellers need them for), especially when multiple operators are available in one area. Tickets that offer transportation for a larger period of time and extra benefits please the travellers, because they perceive them as convenient and uncomplicated.

#### Amsterdam Museumplein

**"We bought 1 Amsterdam card for three days, because we are here for three days that is enough. It is pretty easy. It is (convenient) because it combines attractions, entrance to the museum and other places we would like to see plus public transportation."** - Female (with friend), age: 20-30, Serbia

#### Amsterdam Stationsplein

**"As soon as we got to Amsterdam we went to the travel desk to get a ticket. We got a is it a GVB ticket? It turns out that isn't the ticket we needed. We needed a regional ticket, because where we are staying is just outside of the city, so GVB doesn't cover it. We have been having problem inside trying to get money back and getting a refund of things."** - Male (with partner), age: 20-30, UK

### Ticket Purchase

#### Goal

To pay for the selected ticket either at the T.V.M. or at the service desk. In some cases this might also happen online.

#### Expectation

The payment goes smoothly at the service desk and at the ticket vending machine (or online) and that travellers will be guided through the process.

#### Patterns of use

It was frequently observed that paying for transportation tickets at ticket vending machines is problematic for all sorts of international travellers. The problems observed and mentioned by interviewees are related to paying with bankcards and to paying with coins. Further payment problems, for example at service desks, were not identified.

## 06 - Usage of OV-betalen by international travellers

### Issues

- It was observed that when travellers intend to pay with their bankcards often these are rejected, sometimes because the bankcard they use is by default not accepted by the ticket vending machine, and sometimes because the traveller struggle to select the correct option on the interface of the screen.
- Ticket vending machines request for a pin, also with credit cards. Observations on site showed that this is confusing for travellers from some countries, like the USA, as they do not know their pin, because they swipe their card or sign when they use it in their home country.
- Interviewed service personnel described that if travellers purchase various tickets with one card, sometimes the cards get blocked.
- Ticket vending machines only take coins, and it was observed that many travellers intend to pay cash, but with paper money. Travellers that arrive to the Netherlands, especially from countries that do not have the Euro as currency, usually have paper money, because in many cases they have just exchanged money.
- Observations at ticket vending machines, specifically at the NS ticket vending machines, showed that users frequently don't directly understand the relationship between the interface and the bankcard reader at the moment of actually paying and inserting the bank card: the interface tells users to "follow the instructions on the keypad", which refers to the bankcard reader. However many users do not immediately find the bankcard reader and keep pressing the screen interface.

This whole payment situation is perceived very negatively by all types of travellers, as it is related to a lack of understanding and time loss. Interviews revealed that it is especially impactful on the experience of purpose travellers that lose time trying to pay for a ticket. See figures 29 and 30.

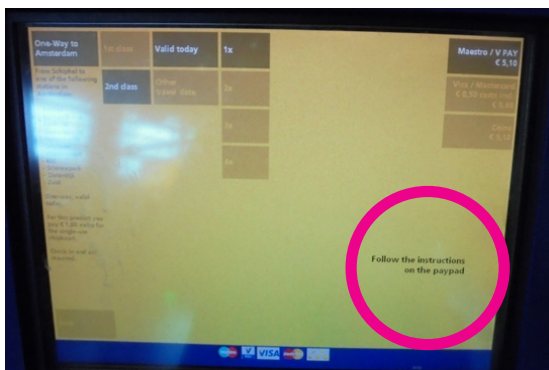


Figure 29. NS ticket vending machines: "Follow the instructions on the keypad" (circled)



Figure 30. NS ticket vending machines: Location of keypad (circled)

Schiphol airport

**"A: "Select another method" – another method?! OK..."Follow the instructions...please wait...enter your pin"  
B: I don't need a pin.  
A: Uh, I know...I can't even read that. I know this.  
B: I don't have one  
A: It says enter pin. It's a credit card...uh, yeah, we don't have a pin. Oh no, its just a credit card. This is ridiculous." – Couple, age: 60 -70, USA**

**Journey preparation**

*Goal*

To search the route from the current location to a destination includes the transportation modalities, lines and interchanges. If there are multiple options for one journey travellers' goals, it also includes selecting the preferable route.

*Expectation*

If travellers know what their destination is, they will be able to find the proper route to get there. Furthermore, they expect enough information to show them where and how they should go.

*Patterns of use*

Interviewees revealed that journey planning for all types of travellers is based on the final destination. Travellers generally know where they are, location A, and where they are going to, location B. With this information they expect to find the way from A to B and to be able to plan their journey.

Journey preparation happens at different contexts for different travellers. It was observed that spontaneous travellers are more likely to prepare at the moment of useage at a stop, see figure 31, station or in the vehicle, while other types of travellers might as well prepare at their hotel or using online sources. There is a wide range of available touchpoints to prepare a journey, like websites, apps, travel guides, brochures, posters, screens, service personnel etc. Nevertheless observations showed that in many cases travellers rely on the information provided on the spot, like signage and maps.

Observations on site showed, that when travellers are in doubt, they recur to ask service personnel for help and guidance. Interviews with service personnel have explained that service personnel provides information not only about one transportation company, not even about public transportation as whole, but about the whole city/country. It has been observed an described by travellers that the way service personnel responds to the diverse questions, can have a major positive or negative impact on the their

## 06 - Usage of OV-betalen by international travellers

experience. For (international) travellers it does not matter from which company the service employee is, they ask all sorts of question in regards to public transport as a whole.

It must be noted that in the Netherlands domestic travellers often use the app 9292 to plan whole travel journeys, the app provides information for a journey from A to B, including interchanges between lines and operators. Other sources only provide information regarding their own company, even if the journey is not the most convenient.

### *Issues*

- Interviews revealed that not in all cases travellers manage to find information required to plan their journey, like at Schiphol airport, where the signage gets blended amongst all other sorts of airport and retail information.
- Sometimes the information provided is not understood or misunderstood, this was for example observed when travellers do not board trains, because their final destination is not the one depicted on the screen by the platform.
- When service personnel is not prepared to answer the sorts of questions travellers approach them with, the perception travellers have of the system as a whole might be damaged as well as their journey.
- International travellers are not necessarily aware that the 9292 app exists (as the name does not read to be related Dutch public transportation), nor always have online access during their stay to use it. When travellers use other sources to find journey information, those not necessarily offer the best option, as the information offered is only provided by one company.

These situations all contribute to a negative or at least not seamless experience with public transportation.

### Amsterdam Stationsplein

**"Then we have to know where the stores are, they ask..."Hema where is Hema" "Hema?" "I want to go to Starbucks." "Is there a pharmacy?" So a lot of questions, different questions. People are getting angry if we don't know a thing from NS you know, they think we have to know if they ask something, but we don't know everything from NS or Connexxion or RET." - GVB employee**



Figure 31. Travellers searching for journey information at the Amsterdam Rijksmuseum stop

### **Trip preparation**

#### *Goal*

To find the correct type of transportation for their trip. Within a journey, trip preparation can happen multiple times if there are interchanges within the trip.

#### *Expectation*

That the signage will lead them to the correct place/ vehicle.

#### *Patterns of use*

Trip preparation has a similar nature to journey preparation. The difference lies in the fact that to prepare a trip the traveller is more focused on the vehicle to get to the final destination, rather than on the final destination itself. Like for the journey preparation, the trip preparation can happen at multiple touchpoints. However it is more likely to happen at stations and stops as the traveller is preparing to use a specific vehicle. Travellers must search for the right transportation modality (in some stations multiple are available: trains, tram, metro, bus). Within trip preparation it has been observed, that even if travellers inform themselves previously about their trip, they have to act on the spot. Therefore information provided should be clear and reliable.

## 06 - Usage of OV-betalen by international travellers

Furthermore, when the correct modality is found the right line and the right travel direction must be found. Extensive observations in the field have shown that especially at large stations this can lead to confusion, hence travellers rely heavily on information screens, posters, signage and maps during this step. If travellers don't find what they need they recur to ask service personnel and vehicle drivers. Service personnel, often the vehicle drivers are a key touchpoint as travellers get information during the moment of use.

### Issues

- Service personnel has stated in interviews, that for international travellers finding the intended transportation might cause misunderstandings due to language and translation, for example in other countries the trams are also called trains.
- If travellers are on a train that cannot continue and information is only provided in Dutch, which usually is the case, if the train is not close to the airports to central station, international traveller experience the system as negative and must take extra steps in order to continue their journey.
- It has been observed and experienced that service personnel usually can communicate information in English, when requested to help travellers to continue their trip/journey.

### Amsterdam Stationsplein

**"They tell us "Yes we have to go by train" for us it's a train inside and they mean this one (the tram) or the metro. Yes. So we have to ask them: which number? Where are you going? Otherwise you send them to a wrong place. I have to ask them which number otherwise he said "Metro" "Metro 13" It doesn't exist. It is a tram." - GVB Service employee,**

### Rotterdam Central

**"More information in English and in Spanish should be provided for people to know what to do or what is happening: often after the announcements in the station people come and ask "What did they say?", because the announcements only are in Dutch. By the moment I can explain to them what happened it might be to late because the train just left." - NS Service employee**

## 6.2.3 Travel experience





### Entering & exiting paid area (ticket validation)

#### *Goal*

To validate their ticket at the gates, poles or in the vehicle if it is required.

#### *Expectation*

It is clear if travellers have to do something with their ticket, when entering and exiting the paid area/ vehicle.

#### *Patterns of use*

When entering and exiting a paid area, travellers validate their tickets. It was observed that when there are gates this clearly hints to travellers that they have to validate tickets. Interviews with service personnel revealed that when there are no gates, travellers do not necessarily know that they have to validate their tickets, this can happen at stations where there are no gates as well as in trams or buses, which usually stop at street stops. From interviews with travellers it became evident that the first time use for travellers, who are not familiar with checking-in and checking-out, is the most problematic. However, as soon as travellers know they adapt to the system. Furthermore, service personnel described that checking-in and checking-out with QR-coded tickets at NS gates (which are the only ones who have QR code readers) is something that causes some problems at gate lines for international travellers. Sometimes the QR codes are not detected or not read properly or accepted by the readers, which probably is caused by technological mistakes, even though the proper readers are available.

#### *Issues*

- + Gates clearly hint to travellers if they should check-in or out.
- Travellers might encounter problems with their ticket if they forget to check-in or check-out.
  - With an Anonymous-OV-chipkaart they risk to lose credit on the card, however with Disposable OV-chipkaarts the system provides more room for error.
- When the QR code on travellers' tickets does not open the gates, travellers then have to talk to service employees, this is a problem, as when travellers are entering they lose time to get to the platform and when they are exiting they are stuck in the system.

### Amsterdam Museumplein

**"Well it was pretty convenient, well at the first moment we had some difficulty with the tram, I mean in our country you can enter any door; and here this whole system of check-in check-out was unusual, but after the tram that left in front of us then on the second tram we had no difficulties - it was pretty easy. Since we didn't know how it works and no one explained us we had to figure it out but it wasn't too difficult."** - Male (with partner), age: 20-30, Hungary

## 06 - Usage of OV-betalen by international travellers

### Travelling

#### Goal

To travel from A to B and to know at which station/stop to exit.

#### Expectation

In the vehicle information will be provided about the stations and stops showing travellers where they have to exit. Some travellers also expect that the public transportation vehicles are comfortable.

#### Patterns of use

For all types of travellers the actual travel takes place within a vehicle of one of the public transportation operators. When in the vehicle travellers can interact with the service personnel (the vehicles drivers or conductors) as well as with apps, or they just listen to announcements or read information on posters and screens. During the travel time it is key for travellers to know where they are, where they are going and when to exit. Figure 32 shows one of the Amsterdam tram lines with a service booth, which helps (foreign) travellers during their trip.

#### Issues

- When information is only provided in Dutch and travellers don't understand it, the experience can be negative, otherwise travelling seems straightforward.

#### Amsterdam Museumplein

**"It is easy to use the tram and we can use the Google maps and it helps."** - Girl (with family), age: 10 -20, Israel

### Interchanging line or modality

#### Goal

To find the correct connecting vehicle for the next trip within the journey. Travellers aim to catch the next possible vehicle to continue their journey.

#### Expectation

Signage will lead travellers to the correct place/ vehicle during the interchange. They expect that it will be clear if they have to do something with the ticket, like validating it again.

#### Patterns of use

Interchanging is related to wayfinding. Depending on the nature of a journey, different travellers might experience interchanges between lines, vehicles or operators. Interchanges take place at stations and stops. Travellers guide themselves through signage and often by asking service personnel where to go next.



**Figure 32.** Several of Amsterdam tram lines have as service booth in the vehicle to help (foreign) travellers during their trip.

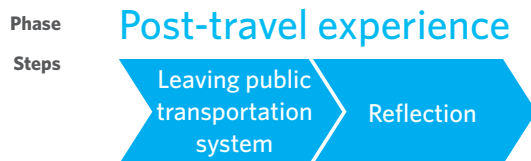
#### Issues

- Interchanges pose a challenge, as travellers are required to check-out and check-in again, when they interchange modalities and in the case of validation at vehicles (trams and buses), they must check-in and check-out every time. Even if travellers know what vehicle they should get in next, finding it with information on the spot, is key for a successful and seamless interchange.

#### Amsterdam Zuid

**Paraphrase:** "People don't see the difference between NS and GVB, they don't see the different colours and even if you put signs on the floor people walk looking at their smartphone and would miss it." - NS service employee

### 6.2.4 Post-travel experience



#### Leaving public transportation system

##### *Goal*

To find the correct exit and direction towards their destination.

##### *Expectation*

Enough information, to show them where they should go to, is provided. Specifically it is expected that the signage/maps will lead them to the correct place.

##### *Patterns of use*

Travellers leave the public transportation system often when they leave the vehicle, like is the case of buses or trams, but also when they leave the train or metro station. The time spent within the transportation system, even though the actual travel journey is over, is related to the public transportation system. The travellers expect information to be available, that will guide them to their final destination, like in figure 33 at Amsterdam Stationsplein. This information usually are signs and maps. However, it can be the case that travellers recur to service personnel for advice. Efficient travellers or purpose travellers might have clearer information on their next step, however spontaneous travellers would typically need guidance and search for the right exit or direction.

##### *Issues*

- Some interviews revealed that travellers might blame the lack of or unclear signage if they get lost or take longer than expected to continue to their destination. This not only happens at stations, but can also happen at the airport.

#### Schiphol Airport

**"A: It is a big airport but you are... the pancarts**

**B: The banners, there are no maps**

**A: To explain the exit of the airport...to go to Amsterdam central it is difficult to find the way that we go. Yeah (we know we want to take the train). In the book (we found the information). And then it is not right which train to take."** – Male (with friends), age: 20-30, France

### Reflection









Travellers reflect about their experience with the public transportation system at different moments in time, it can happen during the journey, but also after a long time. What travellers think about the system, either good or bad, can influence future travellers, who, for example, read blogs and travel websites, or who have friends that through word of mouth influence their decisions. Furthermore, experiencing both positive and negative situations can lead to future assumptions, that will affect the way they interact with public transportation. This step in the customer journey is presented due to its relevance for the user's experience and its impact on the transportation operators, however, it is not researched in depth.
















**Figure 33.** At Amsterdam Stationsplein (located at the entrance/exit of Amsterdam Central station) information about public transportation the surroundings is displayed.

Customer Journey Legend








Journey steps per persona

	PERSONA A: Sam
	PERSONA B: Jonas
	PERSONA C: Péter
	PERSONA D: Gorge
	PERSONA E: Asuna
	PERSONA F: Marie
	PERSONA G: Ana
	PERSONA H: Cathy



Touchpoint Icons

	(P.T.) Websites & Blogs
	(P.T.) Apps/ Smartphone usage
	Information Screens Screens
	Information Posters
	Signage
	Information Brochures
	Travel guides
	Word of mouth/ media
	T.V.M. (Ticket vending machine) A.V.M. (Add value machine)
	Gates/Vadiators
	Service Desks
	Walking Employees
	Drivers/Conductors

Explicit Problems

	Information Overload/ Lack of transparency
	P.T. Operator complexity
	T.V.M.: Only coin payment available
	T.V.M.: Bank/Credit card rejected
	T.V.M.: Unclear ticket names
	Service Personnel
	Signage/ Maps

Further travel related steps

	Searching contextual information
	Searching locational information





### 6.3 Conclusions

This chapter has presented insight on the way international travellers use and interact with the Dutch public transportation system and OV betalen by describing and assessing observations, interviews and personal experience gathered in the field. The patterns of usage by the international travellers have been described, as they provide insight on how people travel and what they do. The usage and interaction issues they encounter with the multiple touchpoints are assessed, as they point out the strengths and weaknesses of the system and point towards the things that need improvement.

The description of the patterns and issues throughout the travel steps has provided several general findings in regards to factors affecting the seamlessness of travellers' experience in Dutch public transportation system. They are the most relevant, because they are the most frequent, meaning that several users encountered them, and/or most impactful, meaning that they have a great impact on the travellers' experience:

- **Searching for information:** Travellers are constantly searching for information related to their journey. Knowing where to find the information, understanding the information provided and having an overview of the options available in terms of transportation in general, operators, routes and tickets can impact the way travellers' use of OV-betalen positively. Several problems related to searching information were encountered.
- **Wayfinding:** Spatial orientation is a recurring factor affecting the seamlessness of travellers' journeys. A successful orientation allows for a more efficient travel experience, which is influenced by the clarity of signage and information provision. In several contexts, like in Schiphol airport, or during interchanges between modalities and/or operators, spatial orientation was problematic for travellers.
- **Knowing what to do (next)** is a further factor affecting the way travellers' interaction with the system. If they don't know what is expected from them to continue their journey, the journey is interrupted and therefore experienced as less seamless, which for example was encountered at open payment borders (where there are no gates).
- **Payment:** Being able to pay in the OV-betalen system is a major issue at ticket vending machines. Frequently problems related to payment (not being able to pay or having the wrong means of payment) at the ticket vending machines were encountered, these problems start off the travellers' experience with the public transportation system negatively.

Classifying the findings into touchpoints provides direction, when developing guidelines and solution for improvement in the next stages of the project. The recurring issues throughout the travel phases are summarized into the relevant touchpoint groups (defined in chapter 3.4.4):

### **Machines**

- Ticket vending machines: When travellers interact with ticket vending machines they encounter several problems. Travellers often do not understand what the ticket names mean and can not know what benefit the different tickets offer, furthermore paying with bank and credit cards causes hassle, as well as the fact that when paying cash only coins can be used and not paper money.
- Payment borders: The open payment borders do not clearly indicate to travellers if they should check-in or check-out to validate their ticket. At closed payment borders (gates) sometimes technical issues don't allow for travellers to use their tickets properly, like when QR codes do not open the gates.

### **Information Provision**

- All sources: Screens, posters, stickers, signage, maps, brochures, websites, apps: Due to the large amount of sources that provide information regarding public transportation, travellers might not have a clear overview of the possibilities they have for transportation during their stay in the Netherlands, nor the ticket options that are available. This happens because there is not one official place to search for information, but several from different companies. They are provided through digital means as well as through analogue ones at the relevant locations (airport, railway stations, street stops). Having an overview of the number of operators is problematic during information search, as well as when travellers must plan their journey and interchange from trip to trip. Furthermore, the fact that not all tickets are valid for the different operators causes the situation, that some travellers must purchase multiple tickets often due to their lack of knowledge and understanding of the system.
- Signage and maps: When signage and maps are clear and available, travellers often find their way independently. However, when they do not find or understand the signs, they feel trapped and as if they were losing a lot of time just searching for essential wayfinding information.

### **Personnel Service**

- Service personnel: In many cases the contact travellers have with service personnel is perceived as positive, because service personnel helps the travellers and advises them. Nonetheless, when service personnel does not advise the travellers properly, travellers experience public transportation negatively and blame the personnel for their bad situations.

Understanding the patterns of use and issues in the Dutch public transportation system experienced by international travellers is essential in order to develop guidelines and solutions to improve the situation. Furthermore, in this study the situation in the Netherlands is the norm and sets the tone for the benchmark analysis, which is presented in the following chapter.



Left to right: London, Hong Kong, Copenhagen signage

## Benchmark: Usage of public transportation tickets by international travellers - 07

### 7.1 Introduction

This chapter provides the findings on the way international travellers use the public transportation in London, Hong Kong and Denmark and how these can be compared to the Netherlands. The first part of the chapter provides a contextual description of the public transportation system at each of these locations. The second part communicates the most striking findings from this benchmark. These are presented in terms of the five established topics for international travellers experiencing public transportation (see chapter 4):

1. Choice of transportation
2. Searching information
3. Ticket selection
4. Ticket purchase at ticket vending machine
5. Public transportation usage

### 7.2 Context Description

The locations selected for the benchmark are London, Hong Kong and Denmark; in chapter 4 further information with regard to the selection criteria is described. These locations cannot be compared one to one. Therefore, a general description of the context of public transportation at each location is provided. Specifically, the public transportation organizations and the payment options are discussed. Additionally, insight with regard to the context of use specifically for international travellers is explained.

## 07 - Benchmark: Usage of public transportation tickets by international travellers

### 7.2.1 London

In the Greater London area buses and the metro system, commonly known as “the tube”, are run by the public transportation organization Transport for London (TfL), which exists as an organization since the year 2000. The government has a say in the fare levels; certain fares are set yearly and influence what the mayor of London ultimately decides to change. Furthermore the authorities have a say in regulations regarding health and safety in the TfL system. TfL also works together with nine different rail companies, that start and end their journeys at London’s stations.

The electronic payment method in London is the Oyster card, which exists since 2003. Also paper tickets are available, as well as the option to pay contactless with the bankcard (UK issued Maestro cards and several credit cards). According to TfL, 50% of the people in London, who have an Oyster card, have the option of the student ticket, veteran ticket, elderly ticket etc., grouped under the terms concessions or adult cards. The other 50% of people use the “pay as you go” system. The tube and train system in London is gated, which means that people must validate their ticket at the beginning and at the end of their journey, in order to pay for it. In buses travellers must validate their ticket only when entering the vehicles, as the bus fares are fixed. TfL envisions a future with Oyster Cards, because they believe there will always be people, who do not have a bank account, for example children, but that still need to use public transport. 10% of people in London do not have a bank account and also there are always people who want to stay anonymous.

In London the price for a journey depends on several aspects. The Greater London area is divided into zones, for which different prices apply. There also is “daily capping”, which means that every time a journey is made a fare is charged. However, once the cost of all the fares reaches a specific amount, the rest of the journeys travelled during that day don’t cost any further. Furthermore, there are peak and off-peak hours, which determine the fare of the journey.

Since April 2015, there are no more ticket offices at stations and there are more ticket vending machines. Service personnel is available at most stations to offer support to the travellers at ticket vending machines, information areas, gates and platforms. A major cause to have service personnel in London’s stations, specifically tube stations, is the large amount of people that use the system. Personnel are there to optimize the flow, manage the crowds, and keep the system going, as the tube is under pressure in terms of high passenger numbers, that concentrate in small spaces (stations constructed many years ago). Additionally, there are “visitor centres” that are responsible for selling Oyster cards, providing all sort of touristic information and sell attraction tickets. The blue (regular) Oyster card can be bought online, at ticket-vending machines, in visitor centres and within agent networks (independent, usually small newspaper shops). When buying a blue Oyster card, a 5-pound deposit is charged. The money on the card, including the 5-pound deposit, can be refunded.

The Visitor Oyster card is targeted at international travellers. When buying a Visitor Oyster card, a 3 pounds deposit is charged, which cannot be refunded. However, the money loaded on the card to travel can be refunded. The card can only be used with the *pay as you go* system and not loaded with concessions.





Figure 34. London, Victoria Station during peak hours (ca. 18:00hrs)

These Visitor Oyster cards are sold online (and can be delivered to the travellers home country before their trip) and also within holiday packages, Easy Jet flights and in some trains like the Euro Star. TfL has communicated that the holiday packages are unexpectedly being sold a lot. Moreover, international travellers can pay within TfL with some contactless credit cards and with paper tickets. The places that sell the most Oyster cards are Heathrow Airport, Victoria Station and Kings Cross station. An evident pattern shows that the most cards are sold on Fridays and in early December and during the summer, when people come into London, showing how important visitors are for the business. The following points summarize the main insights from London relevant to the study:

- The Oyster card is sold as the best option and no evident difference is made between domestic and international travellers' tickets.
- Money on the card can be refunded for free.
- Service personnel are almost always available to support and help travellers throughout their journey.
- In the tube system detailed information is provided for (foreign) travellers.
- Ticket vending machines give the option to use many languages.

## 07 - Benchmark: Usage of public transportation tickets by international travellers

### 7.2.2 Hong Kong

In Hong Kong there are multiple public transportation operators including bus and ferry companies. For this study, however, the main focus is set on the MTR (Mass Transit Railway) system, which includes the metro system, the light rail, the Airport Express train, other trains (like intercity railway services) and the MTR bus. The MTR is largest transportation operator and the most relevant one concerning international travellers in Hong Kong.

The MTR Corporation was established in 1975 with the Hong Kong government as sole shareholder. In the year 2000, the MTR Corporation was re-established as MTR Corporation Limited and in the year 2007 the government-owned rail operator has merged with the Kowloon-Canton Railway Corporation, which is composed by nine railway lines that provide transportation service in Hong Kong Island, Kowloon and the New Territories. Buses provide further access to the different lines and stations. The Airport Express is a high-speed train that provides the fastest connection from the city to Hong Kong International Airport and the Asia World-Expo centre. The MTR's intercity railway services are connected to several locations Mainland China. Furthermore, MTR Corporation is involved with a varied range of business activities, including the residential and commercial sector, advertisement, telecommunication services and international consultancy services. (mtr.com.hk., n.d.) For this study the focus is kept on public transportation services.

The electronic payment method for public transportation in Hong Kong is the Octopus card, it allows travellers to travel across multiple transport operators using a single card. Its development began in the 1990s; in the year 1994 Hong Kong's five major public transport operators (MTR, KCRC, KMB, Citybus and Yau-matey Ferry) created a joint venture, now known as Octopus, to develop and implement the contactless smartcard, which was launched in 1997. From the year 2000 onwards Octopus expanded as a platform for multiple businesses and applications, especially as a payment method in the retail sector, but also by providing access to buildings, supporting various functions at schools and in leisure facilities amongst other (octopus.com.hk, n.d.). The Hong Kong government does not directly regulate Octopus, it regulates the transport companies.

Travellers can buy the Octopus card in the form of a card, but also in the form of ornaments and wearables, that attract different types of customers, for example, watches or ornament-key chains often are purchased by elderly travellers. These work using Near Field Communication (NFC). Octopus also provides an online payment service and an Octopus mobile sim-card. The card can be bought online, at ticket vending machines and at service desks. A deposit of 50 Hong Kong Dollar (HKD) must be paid plus the monetary value, which for the standard adult octopus card is 100 HKD. The money on an Octopus card can be refunded, however, the user cannot keep the card. Under a 90-day use period a 9HKD fee is charged to refund the money on the card. Octopus does not actively advertise the card to tourists. MTR provides tourists specific travel products, for example, the Airport Express Line ticket in which the Octopus card is included. However, most international travellers do not use the Octopus card, but purchase single journey tickets. This is noteworthy, as more than 90% of the residents in Hong Kong have and use an Octopus card.



Figure 35. Hong Kong, Tai Wo Hau Station, travellers waiting for the MTR

The metro comes very frequently, the MTR journey planner only provides information on the approximate travel time from station to station, as every few minutes the next train is at each station. Moreover, the MTR metro system is a fully gated system. The public transportation tickets must be validated when entering and when exiting the system. The Octopus readers can read the MTR single-journey tickets, but these are not part of the Octopus products. In general, the stations are very large and have multiple retail options and offices, service personnel often are available at booths by the gate lines and at the platforms. Several MTR shopping malls are directly connected to the stations above ground. The following points summarize the main insights from Hong Kong relevant to the study:

- The Octopus card is not branded for international travellers (transportation is cheap in general).
- Money on the card can be refunded for a low fee (ca. 1 Euro).
- Signage is extremely clear for first-time users, especially in terms of wayfinding.
- Information is always provided in English.
- Comfortable connection from city to airport (Hong Kong Station & Airport Express).
- New TVMS: selection of ticket by destination, perceived as very straightforward by travellers.

## 07 - Benchmark: Usage of public transportation tickets by international travellers

### 7.2.3 Denmark

In Denmark multiple state-owned transport operators collaborate to provide one electronic payment system called Rejsekort, thus making it comparable to the OV-chipkaart in the Netherlands. The voluntary cooperation between the Danish public transportation companies goes back to the year 2000, when the transport companies decided to renew the system as the paper system, at that time was wearing out. Before the cooperation, 25 different systems existed across the country and the goal was to develop only one type of card for public transportation in Denmark. All the equipment should be connected through the same system. In 2002 Rejsekort was launched.

The companies have different roles: The DSB (Danske Statsbaner or Danish State Railways) runs the trains that provide service for both, long and short distances. It is an independent public state-owned company. Multiple bus companies also cover parts that are not profitable and are part of the political agenda. The Copenhagen metro, which is a private company (but is owned 50% by the government, 40% by Copenhagen's municipality and 10% by Frederiksberg an area in Copenhagen) currently has two lines and five underground stations (further are being built), making it a small system in comparison to other countries' systems.

The Rejsekort tariff is based on the kilometers travelled. The Rejsekort system recognizes where in Denmark the traveller is at, as the tariff structure is not national. The system is not gated, but the travellers have to validate their Rejsekort at the available validators at stations and in vehicles, when entering and exiting the system.

76% of Rejsekort holders have a "Personalized Rejsekort", which includes the name of the traveller and belongs to the concessionary type of tickets, that, for example, includes senior or handicapped travellers. To purchase a Personal Rejsekort a Danish bank account is required. 12% of Rejsekort holders have a so called "Flex card", which also belongs to a registered customer, but can be lent out to anyone to use it. 12% of Rejsekort holders have an "Anonymous Rejsekort". This card can only be loaded on ticket vending machines, opposed to the service to be loaded through a bank account (as it would then lose its anonymity). In order to use an Anonymous Rejsekort nation-wide a deposit of 600 Kronen, approximately 80 Euros, must be paid. This amount is rather large in comparison to other equivalent tickets world-wide. The possibility to travel in groups is also provided by Rejsekort, meaning that under certain circumstances several people can travel with one card.

In Copenhagen many travellers use alternatives to Rejsekort, like season tickets, mobile phone tickets or student cards. The mobile pay is very frequent and popular, due to the perceived convenience of purchasing the ticket on spot, also buying tickets with the mobile phone is cheaper than buying paper tickets, but more expensive than with Rejsekort. The season ticket is not yet included in the Rejsekort, but that is part of future the development plan.

In 1998 the Zone system was introduced in Denmark, there are 95 zones. If people use Rejsekort, the system knows the zone they are travelling in automatically. In terms of costs, there is a maximum of nine zones,





Figure 36. Copenhagen Central Station, DOT ticket vending machines

travelling nine or more zones costs the same. A cardholder always moves from his local area outwards, but the pricing differs per zone. The zone prices depend on the customers' card, meaning that not for everyone the zones start with number 1, for example, a cardholder's zones could be 18 to 26 and all the other zones would count in price category 9+. The zones have a limitation in distance, but also in time. Between 11:00 and 13:00 it is off-peak time and with Rejsekort there is a 20% discount on the journeys. When travelling long distance there are more choices that influence the price of the journey: e.g. Adult with child, youth, senior, 1st or 2nd class etc. The government supervises the transport operators, who make the decisions on the tariffs. The information about pricing on the website shows an overview of all operators and the process people pay using Rejsekort with those operators. The local tariffs are provided on the individual transportation companies' websites.

Since 2015 the umbrella organization DOT (Din Offentlige Transport which translates to "Your public transport") was established in a cooperation between the multiple transportation companies, to provide travel information and sell tickets. The aim of the organization is to have one single communication style for the public transportation as a whole, as previously every company had their own way of communicating.

7-Eleven shops sell public transportation tickets, as not all stations have ticket offices. However, ticket vending machines are wide-spread. DOT service personnel help traveller at stations and check tickets, but also have the role of "stewards" in vehicles. As a tourist, it is very expensive to get a Rejsekort, it cost approximately 10 Euro plus the actual value to travel with the card. To refund the money travellers have to

## 07 - Benchmark: Usage of public transportation tickets by international travellers

write a letter and engage themselves in a rather long and complex process. Tourists, therefore recur to the several options offered and specifically branded for them. In general, for Copenhagen (excluding the rest of the country) the 3-zone tickets are sold the most, as they include the travel from the airport to the city centre. The second most selected option by international travellers is walking, followed by the purchase of 2-zone ticket that are for travel in the city. Moreover, some travellers select the City Pass, which can be a 24 or 72 hours ticket for the city or the Copenhagen card, which includes public transportation and attractions, also for a specific amount of hours/days. The following points summarize the main insights from Denmark relevant to the study:

- Rejsekort is not sold to international travellers purposely; touristic tickets/multiple day tickets are offered instead.
- DOT (translated to Your Public Transport) is an umbrella company for all public transportation operators that communicates in the same style thought operators and public transportation touchpoints.
- The same ticket vending machines are used for all public transportation operators in the Copenhagen area; Rejsekort has separate TVMs.
- Touristic information and public transportation ticket vending machines at airport baggage collection area is successful.

**7.3 Cross-case Analysis:** Comparison between the situation for international travellers in the Netherlands with London, Hong Kong and Denmark

The following segment communicates the most striking findings form the benchmark discussed in terms of the topics:

1. Choice of transportation
2. Searching information
3. Ticket selection
4. Ticket purchase at ticket vending machine
5. Public transportation usage

A detailed analysis, using these topics in a more explicit way of each of the cities'/countries' transportation system and the way international travellers interact with, can be found in appendix L.



Choice of transportation				
General	The Netherlands	London	Hong Kong	Denmark
<p>Choice is based on convenience: accessibility, comfort, distance &amp; efficiency</p> <p>“(From the airport to the city) taxi. It’s easier it is more convenient, we had a lot of luggage, a lot of luggage.” - Male (with partner), age: 40-50, USA, Hong Kong Victoria Peak</p> <p>Many people base their decision on assumptions or past experiences.</p> <p>“Taxi, we don’t know how to use this (train), we just asked and we preferred to use taxi... To get train you need to know first where to get a ticket or something and we don’t know.” - Female (with partner), age: 30-40, Ethiopia, Amsterdam Stationsplein</p>	<p>Travellers, who rented a car or took a taxi at the airport, argued their decision with accessibility to their destination.</p> <p>“Yeah (we have multiple destinations) yes, we live in on the country side so if you visit someone in the countryside then there is no public transportation.” - Male (with partner), age: 50-60, Dutch/USA, Schiphol Airport</p> <p>Travelling with luggage is hard at NS trains, due to the stairs and lack of space for baggage storage. Figure 37. When deciding what type of transportation to use, travellers often check first the distance walking to judge based on that whether it is worth it to purchase public transportation ticket or to use another means of transport. (Observed specially in cities (Amsterdam &amp; Rotterdam).</p>	<p>The tube system provides a feeling of efficiency as the tube trains are constantly running.</p> <p>“(The transportation system) I think is absolutely great. We have not have to wait for more than four minutes for the underground train, we haven’t used the buses yet...” - Male (with friend), age: 30-40, Spain, British Museum</p> <p>Above ground traffic affects the efficiency of buses and might be perceived negatively by some travellers, who are used to more efficient services in their home country or not used to traffic.</p> <p>“Traffic is busy so time waste there or so. Japan is on time, always on time so its different from here.” - Female (alone), age: 20-30, Japan, British Museum</p>	<p>The MTR online journey planner only requires the stations the users are going from and to and not the time. It only provides the approximate travel time from station to station (eg. 32 minutes).</p> <p>“It is quite good it is quite efficient, so there’s are lots of buses over night and also the MTR is running into really late as well, so yeah I find it quite linear.” - Female (alone), age: 30-40, Wales, Ngong Ping</p> <p>The airport express, being designed for travellers, has plenty of space for luggage, power &amp; supplies with all types of sockets and a refreshing atmosphere. Figure 38.</p>	<p>In Copenhagen, 80% of the city is only 600m away from a train/ metro station and travellers have all options in a relatively high frequency, making the public transportation system accessible for travellers.</p> <p>In Copenhagen many travellers &amp; tourists, selected the option to walk, due to the possibility to see the city and attractions on foot.</p> <p>“A: No, we just walking (in the city). We didn’t want to use because we like to walk. ... The distance not so far, not so long, so we B: We found the Copenhagen is not a big city for walking.” - Couple, age: 40-50, Russia, Copenhagen Little Mermaid</p>

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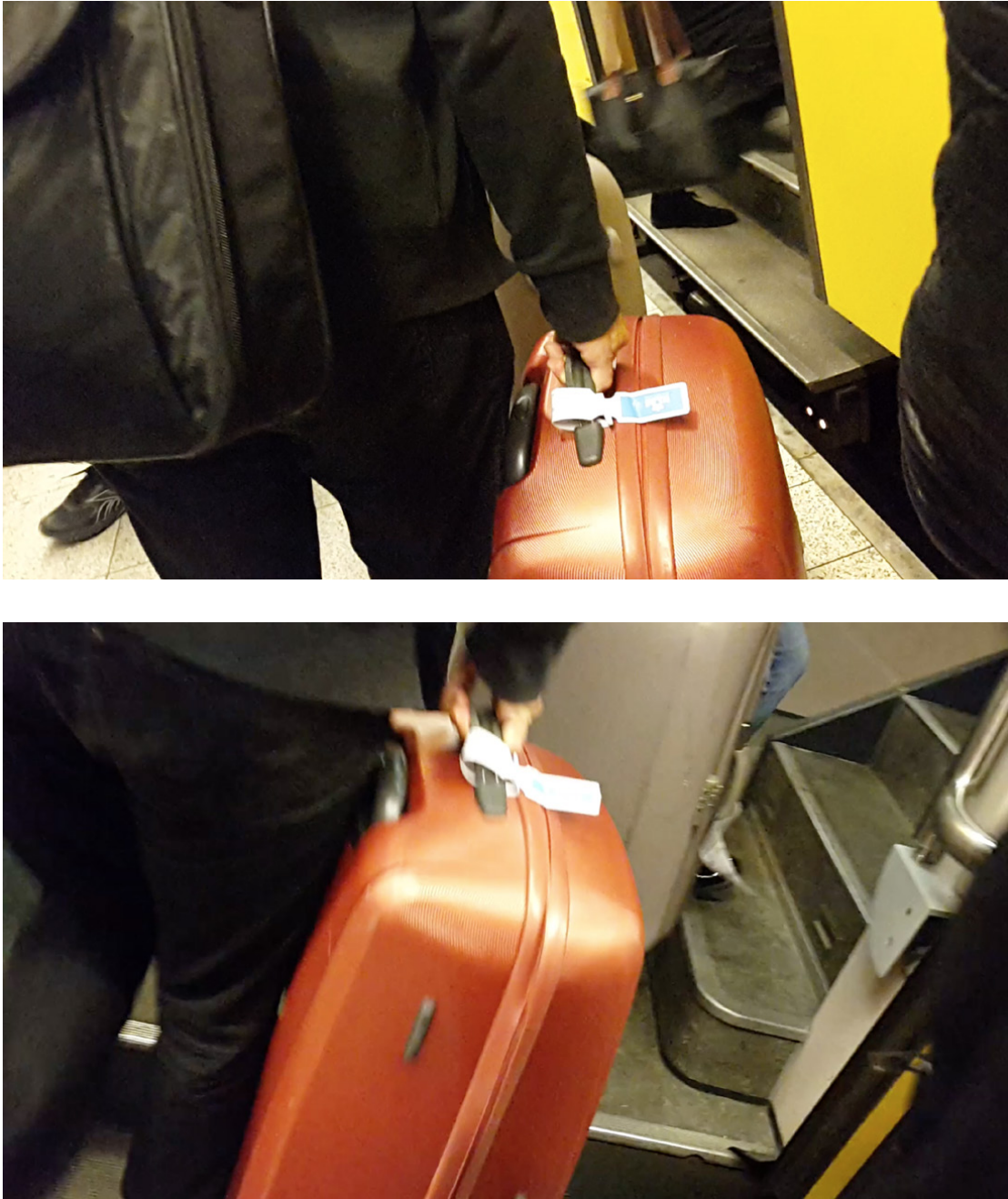


Figure 37. Schiphol Airport, entering NS train with luggage



Figure 38. Hong Kong, Airport Express, designed for travellers



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Searching for information				
General	The Netherlands	London	Hong Kong	Denmark
<p>Many travellers prefer to talk to service personnel rather than look for information themselves.</p> <p>„They have machines, but I like to buy it with the people in front of me. Just because for me it's easier I don't have to look at the screen I just ask what I want and that's it.“ - Male (with friend), age: 30-40, Spain, British Museum</p> <p>Travellers not only ask questions regarding public transportation to service personnel, but all sorts of information about their travels.</p> <p>Paraphrase: When tourists arrive here they do not know anything, they ask where they can find information (maps) or where to buy the tickets or what they need to buy - so we ask them for the duration of their travels and then we tell them what they should buy. - TfL Service Employee, Heathrow Airport</p>	<p>Multiple transportation companies operate in the same contexts- personnel from several companies are available.</p> <p>“Sometimes we go to the machines and help the tourists. We are standing over there and they come to us for NS, but we are standing by GVB. If we know it then we tell them where to go from there...” - GVB Service Employee, Amsterdam Stationsplein</p> <p>In some cases the lack of explanation provided by the service personnel causes travellers to have a negative experience with public transportation, as they purchase a ticket or use the system in the wrong way, because they don't full understand what they are doing.</p> <p>It is observed that in Amsterdam an evident strength are the service booths in most</p>	<p>Service personnel In London personnel usually only are employed by TfL. At some train stations several companies operate together with the TfL, hence, there are employees from different companies.</p> <p>Addressing the TfL employees is quite straight forward, as the usually are underground. Service personnel are available in almost all stations. Figure 40.</p> <p>Observations showed that personnel is very polite. Sometimes personnel was not able to provide information required if the question was too specific. It seems as if they know the basics about the system, which helps out the most</p>	<p>When using the MTR system, travellers are usually underground and the information they request at that location is from one single company and during that moment of use. At each station there is information available concerning the surroundings of the station in terms of buildings, shopping areas, etc.</p> <p>In Hong Kong the personnel is perceived as efficient and knowledgeable. However, the traveller might feel rushed and insecure about asking again.</p>	<p>DOT, which translates to “Your public transport”, is an umbrella organization, that provides travel information and tickets for a group of Danish transport operators. The aim is to have one single face of public transportation, as previously every company had their own way of communicating. Figure 42.</p> <p>Providing information to customers in one single style provides the public transportation system users with a sense of security, as they are serviced by one entity no matter how many transportation modalities (companies) they use during their journey.</p>

This table continues on the next page.

## Searching for information

### General

Successful spatial orientation is key to a pleasant interaction with the public transportation system.

There is information everywhere, you know where to go, there are names of exits and so on."  
- Male (with family), age: 30-40, India, Ngong Ping

The usage of smartphones and often of Google maps, was mentioned in the different countries as a tool on which travellers rely, to find information related to their trip and usage of public transportation.

"I have a Google maps, so I usually can like plan exactly which train I need to get on for the most part... Yeah I think it's been pretty easy, but like I said I rely on my phone pretty heavily. Yeah I go to a lot of places with wifi. Then I'll plan before hand and then I'll just know where to go then take picture screen shots or something and then I'll be good." - Female (with family), age: 20-30, USA, Denmark on train to Helsingor

### The Netherlands

trams, where travellers search for information an purchase tickets. The availability at the moment of use, is, however, not always present in the Dutch system, for example, service personnel is not available at gate lines at most stations.

It often occurs that users do not understand what the signage is trying to communicate in terms of transportation company. Figure 39 shows GVB metro gates above ground in Amsterdam Zuid, these often mistaken with NS (train) gates.

Paraphrase: People don't see the difference between NS and GVB, they don't see the different colours and even if you put signs on the floor people walk looking at their smartphone and would miss it. - NS Service Personnel, Amsterdam Zuid

### London

travellers.

The information provided in the tube is relatively detailed and often targeted at travellers/tourists, as it concerns information related to attraction and the public transportation.

"Yes, (information is) more than enough and in every stop they are like "This is the stop for this and this and this and its an exit only so if you don't want get caught in the cue go one more stop and have a nice long walk.""  
- Male (with partner), age: 30-40, USA, British Museum

### Hong Kong

" Yeah, it's a card. (We bought it) in the service desk. Yeah they were really fast. It was nice, but they were a little bit too fast, because we came from Thailand and you know in Thailand everything is slow and now we get "Oh here your ticket, you can go there, there, there, thank you." We are so: "What?" Yeah, (I would like) maybe that they are a little bit slower and breath and then it was...but I know they are used to do it 24 hours and so I think they are bored and..." - Female (with friend), age: 20-30, Austria, Ngong Ping

The amount of MTR signage and its strategic location guides travellers from early stages in their travels, in many cases from the street to metro station and inside of the stations during all processes of entering, using (eg. interchanging) or exiting. The signage used is efficient through colour coding and also always provided in English. Images on the next page. Figure 41.

### Denmark

DOT applies to service personnel, ticket vending a machines, signage etc. Image on the next page.

In Denmark information often is only provided in Danish, which can result in a confusing or uncomfortable situation for international travellers.

Personal Experience: As a traveller I was insecure during trips on the public transportation due to communication in Danish and not always in English. It is hard as traveller, who does not know the language to even understand station names due to he lack of knowledge on pronunciation, therefore the written information was extremely important for me.

## 07 - Benchmark: Usage of public transportation tickets by international travellers



Figure 39. Amsterdam Zuid Station, metro gates above ground often mistaken with NS (train) gates



Figure 40. London Tottenham Court Station, service personnel always available





Figure 41. Hong Kong Station, a lot of signage to guide travellers



Figure 42. Copenhagen Metro, DOT information for different operators

07 - Benchmark: Usage of public transportation tickets by international travellers

Ticket Selection				
General	The Netherlands	London	Hong Kong	Denmark
<p>Travellers select their public transportation tickets based on the length of their stay, price and extra benefits offered. Travellers that purchase tickets providing extra benefits are usually really pleased.</p> <p>Many travellers have the perception that using an electronic payment card is only relevant for the locals, but not as a tourist.</p> <p>"Yeah no, I only am here for seven days I don't need a card to put money on it here."- Male (with friend), age: 50-60, Australia, Hong Kong</p> <p>Travellers, who do some research previously, seem to have a more straightforward purchase experience.</p>	<p>The Anonymous OV- chipkaart is not very widespread amongst international travellers. Service employees do not recommend the card, due to the high price.</p> <p>"It is also an investment, you pay 7,50 for a card and if you want to get your money back when you leave the country it is minus 2,50. SO you invest 10 Euros and if you are here for three days that's not...if it is for a weekend or if they just make a few trips I don't recommend the OV-chipkaart. Very often it is worth to buy two day or three day travel cards."- NS Service Employee, Schiphol Airport</p> <p>Many options are available in terms of tickets and it often is not clear which one they should choose. The complexity has to do with multiple operators, as well as with the unclear ticket names.</p>	<p>The Oyster card is sold as the best and cheapest option, and as easy/hard to purchase as other types of tickets.. No difference exists for local and international travellers.</p> <p>Most Oyster cards are sold most on Fridays and in early December at Heathrow Airport, Victoria station and Kings Cross station showing the impact of cards purchase by travellers and the vitality of the locations at which the are sold at.</p> <p>The Visitor Oyster card is successfully sold within visitor holiday packages, Easy Jet flights and Euro stars, context and locations relevant to international travellers.</p>	<p>The Octopus card is not actively marketed at international travellers.</p> <p>Public transportation (and other transportation - eg. Taxi) perceived as very cheap.</p> <p>"Yes we know (about the Octopus card), no we (haven't used it) because we don't have any need to use it. The communication system is very cheap so there no need to buy, our trip was very short so." - Male (with friend), age: 20-30, Poland, Ngong Ping</p> <p>"Taxi. Because if it is two persons it is more convenient, because you pay less." - Female (with friends), age: 20-30, Italy, Ngong PingAirport</p>	<p>Rejesekort Anonymous is extremely expensive as a minimum amount of ca. 80 Euros must be on card to use it.</p> <p>Several ticket options are offered to Copenhagen's tourists.</p> <p>The Copenhagen Municipality sponsored an information wall and ticket vending machines at the baggage claim, which is successfully being used by locals and foreign travellers to purchase tickets. Providing relevant insight on the potential to inform travellers and sell tickets to travellers at a relevant moment and location within their journey. Figure 43. (Which in the Netherlands is only possible for domestic travellers, who already own a card).</p>



Figure 43. Copenhagen Airport, baggage claim information wall and TVMs



## 07 - Benchmark: Usage of public transportation tickets by international travellers

Ticket purchase at TVM				
General	The Netherlands	London	Hong Kong	Denmark
	<p>On NS, GVB and RET ticket vending machines travellers had problems understanding the ticket names, as they are not self explanatory. Use cues are not always clear. E.g. "OV-chipkaart".</p> <p>Payment is a problem for many travellers, because bankcards are often rejected and only cash payment in coins is accepted, which travellers frequently don't have.</p> <p>(For elaborate information see chatter 6)</p> <p>"I don't know what the differences between any of these are. Yes, like "Purchase Anonymous Chipcard" or "Purchase Disposable"...I don't know the difference. I don't know. Maybe it's just like a different, like a British version." - Female (alone), age: 20-30, USA, Rotterdam Airport</p>	<p>Some travellers had problems paying with their card at the TfL ticket vending machines.</p> <p>"A: We are going to have to use your credit card its declining my card... B: ...and we are having problems with the machine." " - Fmale (with partner), age: 40-50, USA, Heathrow Airport</p> <p>A lot of languages available at the TfL ticket vending machines, which benefits a larger range of travellers. Figure 44.</p>	<p>The newer TVMs, available in some MTR stations work by pressing the destination on the screen rather than selecting the ticket from multiple tickets options. This way the amount of information, the traveller requires to know and understand, is reduced making selection easier. Figure 45.</p> <p>"Machine, it was very easy you just have to press your destination, your stop and they calculate automatically the total. It's very easy (to find the right way)." - Female (with friends), age: 20-30, Italy, Ngong Ping</p> <p>"Just a one-off (ticket). (I bought it at) a vending machine, extremely easy - I was very impressed by the...I think I just I think with the vending machine I just touched the place on the map that I wanted to go. It was quite nice." - Male (alone), age: 30-40, USA, Victoria Peak</p>	<p>DOT TVM machines, one communication style for all modalities/operators. Figure 36, 42.</p> <p>No explanation of ticket benefits clear at TVM, only ticket names are provided.</p> <p>Different machines are available for Rejsekort and for other transportation tickets in Copenhagen. The Rejsekort machines are not branded at international travellers.</p>

Benchmark: Usage of public transportation tickets by international travellers - 07



Figure 44. London, TfL TVMs offer many languages



Figure 45. Hong Kong, MTR TVMs allow to select ticket per location



07 - Benchmark: Usage of public transportation tickets by international travellers

Public transportation usage				
General	The Netherlands	London	Hong Kong	Denmark
<p>Throughout the study it became evident, that when gates are available (some station in the Netherlands, all TfL underground stations and MTR stations) travellers know what to do when entering the paid area.</p> <p>When gates are not available, travellers might forget or be confused about what to do with their tickets (some stations in the Netherlands and always in Denmark. In London and Hong Kong only very few are confused).</p>	<p>Gates help travellers not to forget to check-in and check-out. People don't recognize differences between operators at gates and still make mistakes because of that.</p> <p><i>"Well it was pretty convenient, well at the first moment we had some difficulty with the tram, I mean in our country you can enter any door; and here this whole system of check-in check-out was unusual, but after the tram that left in front of us then on the second tram we had no difficulties - it was pretty easy. Since we didn't know how it works and no one explained us we had to figure it out but it wasn't too difficult."</i> - Male (with partner), age: 20 -30, Hungary, Amsterdam Museumplein</p> <p>Often gate related problems happen, when travellers cannot enter or exit the system with the type of ticket they have, like paper tickets with QR codes printed on them.</p>	<p>The usage of the Oyster Card is straight forward in the tube, because of the gates and also in the bus as people can only enter the front door and usually exiting the back door, which has no validator.</p> <p>If something goes wrong with ticket at the gates, people read on the screen "seek assistance" - people usually go to the service personnel standing around. Neither the gates nor the personnel give feedback on what went wrong at that moment, but just open the gate and let people pass.</p> <p>Announcements in the tube providing detailed information are perceived as positive &amp; guiding.</p>	<p>The system provides guidance to the travellers through their journey spread across several touchpoints, from the moment of access to stations, the way of entering a transportation vehicle and the place where the vehicle is located at. These types of guiding elements determine the experience of all travellers, but especially of travellers, who are not familiar with the system, more seamless than if they were not provided. images</p> <p>Due to the gated system, first time users have a clear guidance on what to do and can easily go through the system without major issues.</p>	<p>The system provides less guidance to the travellers, for making the usage travellers not familiar with the system, less seamless. The system is not gated and there are multiple ways available to validate tickets so the users are not sure about the way they should validate their tickets or simply forget it, running the risk of getting fined.</p> <p><i>"...but we have been really confused by whether we need to validate our card or not. So it says the date on there - I guess it's just a one day pass. One of the paper things. And I know there are those machines (validators), but I don't really know what to do with them so we just hopped on and hope that it works."</i> - Female (with family), age: 20-30, USA, Denmark on train to Helsingør</p>

#### **7.4 Conclusions**

This chapter has provided insight on the way the transportation systems in London, Hong Kong and Denmark provide their service to international travellers and how international travellers use and experience it. Also a comparison amongst the situation in the Netherlands, London, Hong Kong and Denmark has been made, taking the Dutch system as the frame of reference. The situations are compared through recurring topics (choice of transportation, searching information, ticket selection, ticket purchase at TVM and public transportation usage), which emerged from the individual insights from the field research, in a bottom up approach (see chapter 4.4).

The gained insights provide guidance when developing requirements and solutions for current problems for international travellers' experience in the Dutch public transportation system, as they highlight the implementation of things that work well and the ones that don't. These insights will be used in the design phase of the project, as they offer direction, especially when it comes to the positive examples that the Dutch system can learn from.

The following chapter concludes the findings of the whole study including the Dutch analysis as well as the benchmark. Additionally, it discusses the themes relevant to consider during solution development phase of the project.

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maandag, dinsdag, woensdag, donderdag		12	12	12	12	12	12	12		is de nacht van zondag op maandag t/m woensdag op donderdag. Ook geldig in de nacht voor de Kerstdag, 2e Kerstdag, 2e Paasdag, Hemelvaart en 2e Pinksterdag, met een ochtendritten tot aanvang van het dagnet. / is the night of sunday-monday to wednesday-thursday. Also valid in the nights before Christmas Day, Boxing Day, Easter Monday, Ascension Day and Pentecost Monday, with additional rides until the beginning of day service.
vrijdag		12	12	12	12	12	12	12		is de nacht van donderdag op vrijdag. Ook geldig in de nacht voor Goede Vrijdag. / is the night of thursday-friday. Also valid in the night before Good Friday.
zaterdag	42	12	12	12	12	12	12	12		is de nacht van vrijdag op zaterdag. / is the night of friday-saturday.
zon- en feestdagen	42	12	12	12	12	12	12	12	12	is de nacht van zaterdag op zondag. Ook geldig in de nacht voor Nieuwjaar, 1e Paasdag en 1e Pinksterdag. Let op: voor overige feestdagen geldt een afwijkende dienstregeling. Zie noot bij maandag. / is the night of saturday-sunday. Also valid in the nights before New Year's Day, Easter Sunday and Pentecost Sunday. Take notice: for other public holidays a different timetable is in use, see the note/explanation on 'monday'.

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### 8.1 Introduction

This study has established the current situation, that international travellers in the Netherlands experience when using OV-betalen. To do this different aspects related to the way international travellers interact with the system have been studied, such as the organizational set-up of the system, the variety of contexts and touchpoints, as well as insights from observations and interviews in the field. Furthermore, results from the field research of the systems in London, Hong Kong and Denmark, provide a comparison that establishes points from which the OV-betalen system could learn and broaden the perspective on solutions by identifying processes, products, services and strategies that can lead to improvement in the Dutch context.

This chapter provides an overview of the main findings related to the usage of OV-betalen by international travellers. It discusses the strengths and weaknesses of the system in terms of aspects that affect the experience international travellers have with OV-betalen. The insights ultimately are a means to establish in which areas the Dutch system could improve to provide a more seamless experience to international travellers arriving at an airport in The Netherlands. In order to develop solutions for the current situation, it is fundamental to understand what it means to purchase and use public transportation tickets. Four recurring themes, which can be improved throughout contexts and touchpoints, that affect the purchase and usage of OV-betalen, are established:

- Searching for information
- Wayfinding
- Knowing what to do (next)
- Payment

These themes will be addressed in the solution development phase of the project. Additionally, this chapter discusses the limitations of the study.



## 08 - Conclusions & Discussion

### 8.2 Types of International Travellers

Four different groups of international travellers have been identified after interviewing and observing travellers in The Netherlands, London, Hong Kong and Denmark. The types of traveller groups are the following:

#### Spontaneous travellers

- No previous public transportation information.
- No or vague plan for their stay.
- Walk through the city and spontaneously decide where to go or what to do.
- Only use public transportation incidentally.

#### Efficient travellers

- Have a plan for the stay, often the plan is to see as many attractions as possible in a specific time frame.
- Check the best options in terms of tickets and activities or a combination of both, either before the trip online or in a travel guide or upon arrival.
- A comparison between price, length of stay and ticket benefits is part of these travellers ticket selection process.

#### Purpose travellers

- Have a specific destination; usually have to go to that destination and back.

#### All-set travellers

- Usually are visiting friends and family.
- Use public transportation, however are supplied with tickets and information by their companion.

The variety of travellers shows that the different types of travellers have different needs when it comes to usage of OV-betalen and public transportation. In order to improve the system, travellers' needs should be considered in order to address a larger range of users and provide a better service overall.

### 8.3 Travel Phases

There are four main travel phases that consist of multiple steps travellers take when interacting with public transportation:

- **Pre-public transportation experience** (steps: general orientation about the trip and choice of transportation modality)
- **Pre-travel experience** (steps: ticket orientation, ticket selection, ticket purchase, journey preparation and trip preparation)



- **Travel experience** (steps: entering the paid area (check-in), travel (time spent in the vehicle), interchanging (between lines or modalities), exiting the paid area (check-out))
- **Post-travel experience** (steps: leaving the public transportation, reflection)

Because travellers go through the steps using different touchpoints in different contexts, as multiple parties are responsible to provide the means to interact with public transportation in the different phases, there is no right or best way to use and the experience the system. The travel phases and steps show that purchasing a ticket actually cannot be treated as an individual action, but that the whole travel journey and experience of international travellers must be considered to create a seamless experience. In order to improve OV-betalen for international travellers the diversity of use cases and the different combinations of touchpoints and locations should be incorporated into the solution.

## 8.4 Purchase & Usage of OV-betalen: Room for Improvement

International travellers usually are first-time users of the Dutch public transportation system and OV-betalen. Guidance during first time use is therefore of major importance to assure a smooth travel experience. To improve the experience of international travellers arriving at an airport in the Netherlands recurring themes that negatively affect the purchase and usage of OV-betalen are defined: searching for information, wayfinding, knowing what to do (next) and payment. In order to develop solutions for the current problems international travellers have, these themes propose direction to conceptualize and develop solutions for the different types of travellers, different travel phases, contexts and touchpoints. In the concept development phase not only will these areas focus on existing contexts, touchpoints and services, but provide guidance when exploring areas and moments in the customer journey to enhance the system that pose opportunities, such as the travel phase where travellers are in their home airport and flight to the Netherlands.

### 8.4.1 Searching Information



Travellers are constantly searching for information related to their journey. Knowing where to find the information, understanding the information provided and having an overview of the options available (in terms of transportation in general, operators, routes and tickets) can impact the way travellers' use of OV-betalen positively.

During the *Pre-public transportation experience* phase multiple sources, including ones provided by the transportation organizations, as well as "non-official" sources, like blogs, are available for travellers to inform themselves about their destination and about public transportation in the Netherlands. Efficient travellers are the ones who experience the pre-public transportation experience more in depth, as they prepare their trip more in detail often before they arrive to the Netherlands.

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The decision to choose a specific transportation modality by international travellers is based on accessibility, comfort, distance and efficiency.

During the *Pre-travel experience* phase, travellers select their tickets depending on the length of their stay, the price of the ticket and often because the ticket offers extra benefits like discounts to attractions. While efficient travellers might have pre-knowledge on the tickets options and travel routes, spontaneous travellers and often purpose travellers first come in contact with the system during the *Pre-travel* phase, meaning that they must rely on information provided at the moment of use.

It was observed that often international travellers do not know what an OV-chipkaart is and that ticket vending machines do not offer an explanation in regards to the tickets' benefits. The Anonymous OV-chipkaart is not widespread amongst international travellers, the benefits of using one are not communicated clearly and due the high price required to travel with it, it is not recommended by service employees. Sometimes travellers purchase the wrong tickets (for a different operator) due to lack of knowledge or understanding of validity of tickets at different operators.

### *Discussion*

The large amount of information available can lead to a loss of overview and perceived lack of transparency, influencing the way the different types of travellers make their decisions related to public transportation. Even if the travellers have the willingness to inform themselves and prepare themselves in regards to public transportation (especially applicable to efficient travellers), if the information provided is not clear, travellers might experience the information search negatively or even give up and solve the problem upon arrival to the Netherlands.

When a clear overview of the possibilities available and their benefits is not evident to the travelers, they often base their decision on previous experience or on assumptions. Often the lack of knowledge leads travellers not to use public transportation or not to select the best (ticket) option for their situation. If the information required to make this decisions is not perceived as sufficient or clear, the travellers might have a negative perception of the transportation system as a whole. The decision to choose a specific transportation modality by international travellers is based on convenience (evaluated through accessibility, comfort, distance and efficiency). These are points that can be explicitly communicated by the public transportation organizations, to make the service and its benefits as transparent as possible. The *Pre-travel* phase of travellers' journeys determines how the whole travel experience of the traveller will be perceived to a large extent. Decisions regarding the whole journey from A to B and the ticket purchase take place in this phase. Spontaneous and purpose travellers are more likely to experience this phase more negatively while searching for information, as they are not prepared and usually need the public transportation tickets and service directly.

The types of tickets available to international travellers are not always clear, due to the names of the tickets. Furthermore, dealing and understanding operator complexity can have a negative effect on the experience of travellers, who must purchase several tickets for the time of their stay. Therefore, improving the way information is communicated, in terms of creating a clear overview of options and the language and terminology used, by the public transportation system can positively impact the experience international travellers have when purchasing and using OV-betalen.

### 8.4.2 Wayfinding



Spatial orientation is a recurring factor affecting the seamlessness of travellers' journeys. A successful orientation allows for a more efficient travel experience, which is influenced by the clarity of signage and information provision. In several contexts, like in the Schiphol airport, or during interchanges between modalities and/or operators, spatial orientation was problematic for travellers.

Wayfinding is relevant during the *Pre-travel* and *Travel* phase, as travellers often struggle to find the proper platform, vehicle, modality etc. This happens either previous to a trip or during an interchange. Also in the *Post-travel* phase when travellers leave the public transportation system (exiting the actual modality/station or stop), it was observed that some travellers struggle to find the proper exit and find the way from the public transportation system to their final destination. Wayfinding affects all types of travellers equally, however it was observed that many travellers use their smartphone apps, like Google Maps, for guidance, which has proven to be an advantage during the travel journeys.

#### Discussion

International travellers are not familiar with locations during their travel journey, hence need guidance throughout the whole trip to facilitate spatial orientation. The experience previous to a trip, during an interchange or when leaving the public transportation system is perceived as positive when clear guidance is provided to help them carry out their next step. Travellers might blame the lack of or unclear signage if they get lost or take longer than expected to continue to their destination. Apps and smart phones are experienced positively by travellers when searching for guidance in terms of wayfinding and therefore are a relevant opportunity to provide personalized information to travellers at the moment of use, however the current high costs of internet access while abroad must be considered when developing solutions in this field. Optimizing wayfinding thought all travel journeys can greatly impact the whole experience of international travellers with OV-betalen.

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### 8.4.3 Knowing what to do (next)



Travellers often do not know what to do (next). If they don't know what is expected from them to continue their journey, the journey is interrupted and therefore experienced as less seamless, which for example was encountered at open payment borders (where there are no gates).

In the *Pre-travel* phase, when planning a travel journey, the travellers usually know where they want to go to and expect to find information that will help them find the way to their final destination. When travellers prepare a trip, decisions or actions are often based on information provided on the spot, travellers succeed if they find enough information to help themselves to for example find the right vehicle, line and direction. When this is not the case and information provided is not understood or misunderstood travellers recur to ask service personnel. Public transportation service personnel are faced with questions about public transportation as a whole, not only the company they work for, as well as questions regarding the travellers' stay in general.

Further on in the journey, during the *Travel* phase travellers can forget to check-in and check-out at open payment borders, which with an Anonymous OV-chipkaart can result in financial losses. At gates sometimes QR-codes are rejected due to technological issues, causing travelers to be stuck inside of the station or hinder them from getting to their train/metro. During this phase interchanging in the Dutch transportation system is challenging for travelers, because they are required to check-out and check-in again when they interchange modalities and in the case of validation at vehicles (trams and buses) they must check-in and check-out every time, which is something that takes time to get used to.

#### *Discussion*

Even if travellers inform themselves previously about their trip, they have to act on the spot. Therefore, information provided should be clear, reliable and not only in Dutch. It is key to consider that the way the service personnel communicate with the travellers can have a great impact on the experience the travellers have. If the travellers feel that they made a mistake and they bought their ticket with the service personnel, they will blame the personnel, the company or even the whole public transportation system. During the actual travel, travellers expect to be informed if they have to do something with their ticket when entering or exiting a paid area. The stations with gates facilitate validation as they reduced the possibility that problems occur due to forgetting to check-in or check-out. During the travel time it is key for travellers to know where they are, where they are going and when to exit. Successful interchanges between lines, vehicles and operators are based on the information travellers have on the spot (screens, posters, signs, maps, announcements, etc.). In general, successful communication of processes and feedforward at different touchpoints plays an important role for efficient public transportation usage.

#### 8.4.4 Payment



Being able to pay in the OV-betalen system is a major issue at ticket vending machines, something that usually happens in the *Pre-travel* phase of the whole travel journey. Frequently problems related to payment (rejected bankcards and the fact that machines only allow cash payment in coins and travellers often only have paper money) at the ticket vending machines were encountered by all sorts of international travellers.

##### Discussion

Optimizing the ticket purchasing systems will benefit the experience of international travellers using OV-betalen significantly; apart from searching for information, it is one of the first moments of contact between the international travellers and the system and currently these problems start off the experience of travellers with the public transportation system negatively.

#### 8.4.5 Touchpoint Problems

The interaction that international travellers encounter with several touchpoints contributes to negative experiences when purchasing and using OV-betalen. The following paragraphs describe the touchpoints weakness in the system and figure 46 illustrates the relationship between the touchpoints and the previously established themes (searching for information, wayfinding, knowing what to do (next) and payment).

**Machines:** The interaction with ticket vending machines is problematic, as travellers often do not understand what ticket names mean and have trouble selecting the proper ticket. Also payment at the ticket vending machines is problematic, because bankcards are rejected and payment with cash is only possible with coins and, which frequently international travellers don't have. Open payment borders do not clearly indicate to travellers if they should validate their tickets and QR codes not always are properly ready by the validators.

**Information provision:** Screens, posters, stickers, signage, maps, brochures, websites, apps and audio announcements are some of the many means used by the public transportation operators to provide information. There is a large amount of information provided in regards to the Dutch public transportation system online. Also there are many sources of information at different contexts, however due to the large number of operators the information provided causes travellers to lose overview and not know what option is best. This lack of overview is experienced both on digital sources as well as at the different contexts of use. In some cases the information is only provided in Dutch and not in English, hence international travellers might be able to access the information but then fail to understand it.

















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**Personnel Service:** Often it was encountered that travellers requested information of all sorts from the service employees, however these were not always prepared to provide the information requested. The quality of the service depends on their attitude and knowledge ability of the personnel.

### *Discussion*

It was established in chapter two, the literature review, that no service failure at all is what is expected from customers of product service systems. However, service failure has been found in terms of usage of the Dutch public transportation system for international travellers, especially in the area of self-service. Ticket vending machines and validators belong to the groups of technology-based self-service and are touchpoints that frequently cause the traveller to have problems. It was argued in chapter two, that companies should provide alternative solutions to failure to smoothen the effect these failures have on travellers; in the case of the public transportation system travellers seek for help and advice from service personnel. Even though it is positive that personnel are available it was found that often service personnel does not provide the appropriate guidance. This aspect has a large impact on the users' experience, because service failure is most likely to not be tolerated twice by the customers and results in a negative perception of the service providers. Thus, customer expectations are not met in terms of what customers want, the standards they are willing to accept and the prediction of the service they will receive, and the service is currently rated poorly.

**Figure 46.** Relationship between touchpoints and recurring themes to develop solutions in the design phase of the project

Themes Touchpoints	 Searching for information	 Wayfinding	 Knowing what to do (next)	 Payment
 Validators: Gates & Poles	●	●	●	●
 Ticket vending machines	●	●	●	●
 Service Personnel	●	●	●	●
 Websites	●	●	●	●
 Apps/ Smartphone	●	●	●	●
 Signage/ Maps	●	●	●	●
 Information Posters	●	●	●	●
 Information Screens	●	●	●	●
 Audio Announcements	●	●	●	●
 Flight related touchpoints	●	●	●	●

- Touchpoint closely related to theme, hence opportunity for improvement
- Touchpoint not/less closely related to theme
- Opportunities to develop solutions for theme within flight

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### 8.5 Benchmark Comparison

A comparison amongst the situations in the Netherlands, London, Hong Kong and Denmark has been made taking the Dutch system as the frame of reference. The gained insights provide guidance when developing requirements and solutions for current problems for international travellers' experience in the Dutch public transportation system, as they highlight the implementation of things that work well and the ones that don't. Figure 47 summarizes the most striking insights from the benchmark. The first column is dedicated to findings that correspond to two or more countries and the rest of the columns present findings per country.

### 8.6 Limitations

The insights and results of this study are mostly based on interviews, observation and personal experience in the field. These qualitative research approaches provided a wide range of insights related to the way international travellers interact with the Dutch public transportation system and OV-betalen, as well as how international travellers interact with the systems in London, Hong Kong and Denmark. The findings, especially for the situation in the Netherlands, were repeated at different instances of the research process, allowing to make justified conclusions. The most problems were found in the *Pre-travel* phase of travellers journey, because approaching travellers in that phase is most accessible during the field research. If travelers would be shadowed throughout their whole journey, perhaps more problems would arise in the other travel phases.

The research conducted during the benchmark was carried out within a shorter time of approximately one week per location, while the research in the Netherlands took place for several months. This influences the findings in the sense that the data gathering abroad occurred in a more compact way and the research in the Netherlands was gathered through a lengthier process.

The most intense research months for this study were October and November, months that are not necessarily related to high international traveller visitor numbers. Carrying out the study during the high tourism seasons (e.g. summer months) might provide slight differences, most probably providing similar findings in a more stressed manner.

The interviews carried out were of conversational nature. Even though an interview guide was employed, the conversations with the interviewees were always different; hence not all interviews provided the same type of information. This approach was successful in the sense that most interviewees engaged into the

**Figure 47.** Most striking insights from the benchmark study amongst the Netherlands , London, Hong Kong and Denmark

### Benchmark: Striking Insights

General	The Netherlands	London	Hong Kong	Denmark
<ul style="list-style-type: none"> <li>Many travellers have the perception that using an electronic payment card is only relevant as a local, but not as a tourist.</li> <li>Many travellers prefer to talk to service personnel rather than look for information themselves.</li> <li>The usage of the smartphone, especially of Google (Maps), is broad and perceived as very useful by international travellers.</li> </ul>	<ul style="list-style-type: none"> <li>The Anonymous OV-chipkaart is barely purchased by international travellers and not recommended by service personnel.</li> <li>Several ticket options are available for tourists within cities; the <i>I amsterdam</i> card with extra benefits is appreciated by travellers.</li> <li>Ticket terminology and options often are not understood by travellers.</li> <li>Service personnel are often available and approached by travellers, however the personnel is from different operators, hence, not trained to provide information about all companies. Service personnel are located at relevant location, for example in the tram booths in Amsterdam.</li> </ul>	<ul style="list-style-type: none"> <li>The Oyster card is sold as the best option and no evident difference is made between domestic and international travellers' tickets.</li> <li>Money on the card can be refunded for free.</li> <li>Service personnel are almost always available to support and help travellers throughout their journey.</li> <li>In the tube system detailed information is provided for (foreign) travellers.</li> <li>TVMs give the option to use many languages.</li> </ul>	<ul style="list-style-type: none"> <li>The Octopus card is not branded for international travellers. (Transportation is cheap in general.)</li> <li>Money on the card can be refunded for a low fee (ca. 1 Euro).</li> <li>Signage is extremely clear for first-time users, especially in terms of wayfinding.</li> <li>Information is always provided in English.</li> <li>Comfortable connection from city to airport (Hong Kong Station &amp; Airport Express).</li> <li>New TVMS: selection of ticket by destination, perceived as very straightforward by travellers.</li> </ul>	<ul style="list-style-type: none"> <li>Rejsekort is not sold to international travellers purposely; touristic tickets/multiple day tickets are offered instead.</li> <li>DOT (translated to Your Public Transport) is an umbrella company for all public transportation operators that communicates in the same style through operators and public transportation touchpoints.</li> <li>Same TVMs for all public transportation operators in the Copenhagen area, Rejsekort has separate TVMs.</li> <li>Touristic information and public transportation ticket vending machines at airport baggage collection area is successful.</li> </ul>

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conversation. Due to this holistic approach applied to interviews, new insights could emerge each time during the conversations, providing a broader range of findings. A structured interview approach might provide more homogenous insight, however would limit the interviewees to the researchers questions and conceptions.

The interviewees approached and selected for the user interviews were based on assumptions by the researcher that they are international travellers. In most cases these assumptions proved correct, but in some cases the interviewees were residents of the country with an international background. This situation, however, happened very seldomly and does not affect the drawn conclusions.

During the benchmark the researcher was an international traveller at the different cities and was able to experience first hand what the target group of the study experienced. During the research in the Netherlands the researcher is an international resident in the country and has more knowledge about the system than abroad. This does not affect the findings, as in the Netherlands a higher number of interviews with the target group provided a clear picture of the experiences with the system. Furthermore, the research in Denmark was more focused on understanding the system, due to its similar set-up to the Dutch system, and more expert interviews were carried out than in the London and Hong Kong. Therefore, less user interviews could take place due to the time restrictions and scheduled appointments at companies.

### 8.7 Next Phase

The next phase of the project is the Design Phase. Human-centred design solutions are conceived, designed, tested and iterated to ultimately define short, mid and long-term solutions to current problems experienced by international travellers arriving at an airport in the Netherlands, who use OV-betalen. The previously established recurring themes that affect the purchase and usage of OV-betalen, which are searching for information, wayfinding, knowing what to do (next) and payment are used as guiding basics to develop solutions that potentially will improve the system in a user-centred way and suggest a future vision.



**Searching for  
information**



**Wayfinding**



**Knowing what  
to do (next)**





**Payment**




 **OV Tickets & Info**  
 Tickets for tram, bus, metro


 **VVV**  
 Tourist information

 **Voetgangersroute**  
 Pedestrian route

 **Ferry** west: **EYE/Buiksloterweg** east: **Uplein**  
 NSDM

 **Taxi**

 **Fietsverhuur**  
 Bikes rental

 **Nachtbussen** Nightlines  
 01:00 - 05:00 h

[illegible][illegible][illegible][illegible]

**SLA ALARM  
TEGEN TTIP!**

10 OKTOBER, AMSTERDAM  
10 UUR, JONAS DANIEL NIEDEPLEIN

**STOPTIPPA!**

BRANDHASE  
EN  
HANDBRANDOM  
IN DE KAST  
AANWEZIG



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## Figure References

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The other photos were mostly taken during the field research by myself. The following list provides the references for images retrieved from websites as well as the source of icons used throughout the report.

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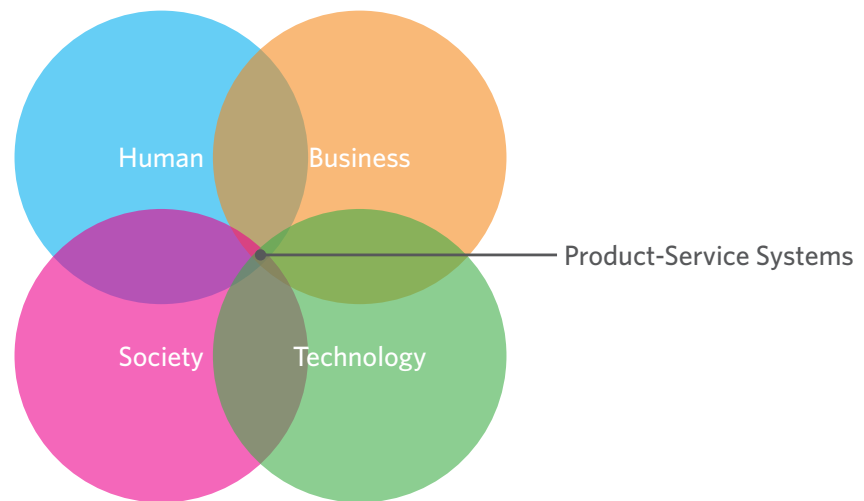






- A - Description of the social innovation model elements: human, society, business and technology
- B - Visualization of available tickets for Connexxion, GVB and RET
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- D - Stakeholder contacts: interview summary of project partners - & organizational role of interviewees
- E - Infographic representing the most relevant facts for the study in regards to inbound tourism retrieved from the NBTC Holland Marketing report
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## Appendix A - Description of the social innovation model elements: human, society, business and technology



Social innovation model by Van Kuijk adapted from the Human-centred design model by IDEO (2009)

### Human

The way humans interact with the public transportation system are crucial to the study to find the strengths and the weaknesses and improve the system as whole. The system should be perceived as more desirable. Developing user-centred solutions to interact with the public transportation system will provide people with a pleasant holiday or business stay and additionally contribute positively to the Netherlands as a destination.

## **Appendix A - Description of the social innovation model elements: human, society, business and technology**

### **Society**

Everyone in society, also foreign travellers, should have easy access to public transportation. The public transportation system should be sustainable and by developing into a more attractive service it might encourage more travellers to use it. In general a better public transportation system for international travellers will ideally make the country more inviting and accessible.

### **Business**

Without sustainable business decisions and the investment made by the stakeholder companies the system cannot improve. Creating user-centred solutions can only happen if the business considerations from the multiple stakeholders are understood and contemplated while developing solutions. The viability of the solutions therefore is key throughout the development.

### **Technology**

Developing technologies are key towards finding solution that will enable all of society to easily access the public transportation system. Technology-based-self-service plays a major role in the strengths and weaknesses of the current system. Current technology forms are limitations to the system and future technologies present possibilities for improvement or threats when not dealt with. Design can mediate and use these possibilities to an advantage of the system and society. Feasibility in regards to technology is fundamental for a successful development.





















## Appendix B - Visualization of available tickets for Connexxion, GVB & RET

One of the initial steps to understand the ticketing context of the project stakeholders public transport companies in the Netherlands is having an overview of their ticket offerings. The following is a summarized visualization of the possibilities travellers in the Netherlands have. It is important to note that only the found information provided online was used, if information was not stated online it is not used in the visualization. The visualizations for Connexxion, GVB and RET are pictured as explicitly as possible. It is evident that NS has the most products; nevertheless most of these products fall under supplements on the personalized OV-chipkaart, which are less relevant for the international travellers group, therefore was not part of the visualization.

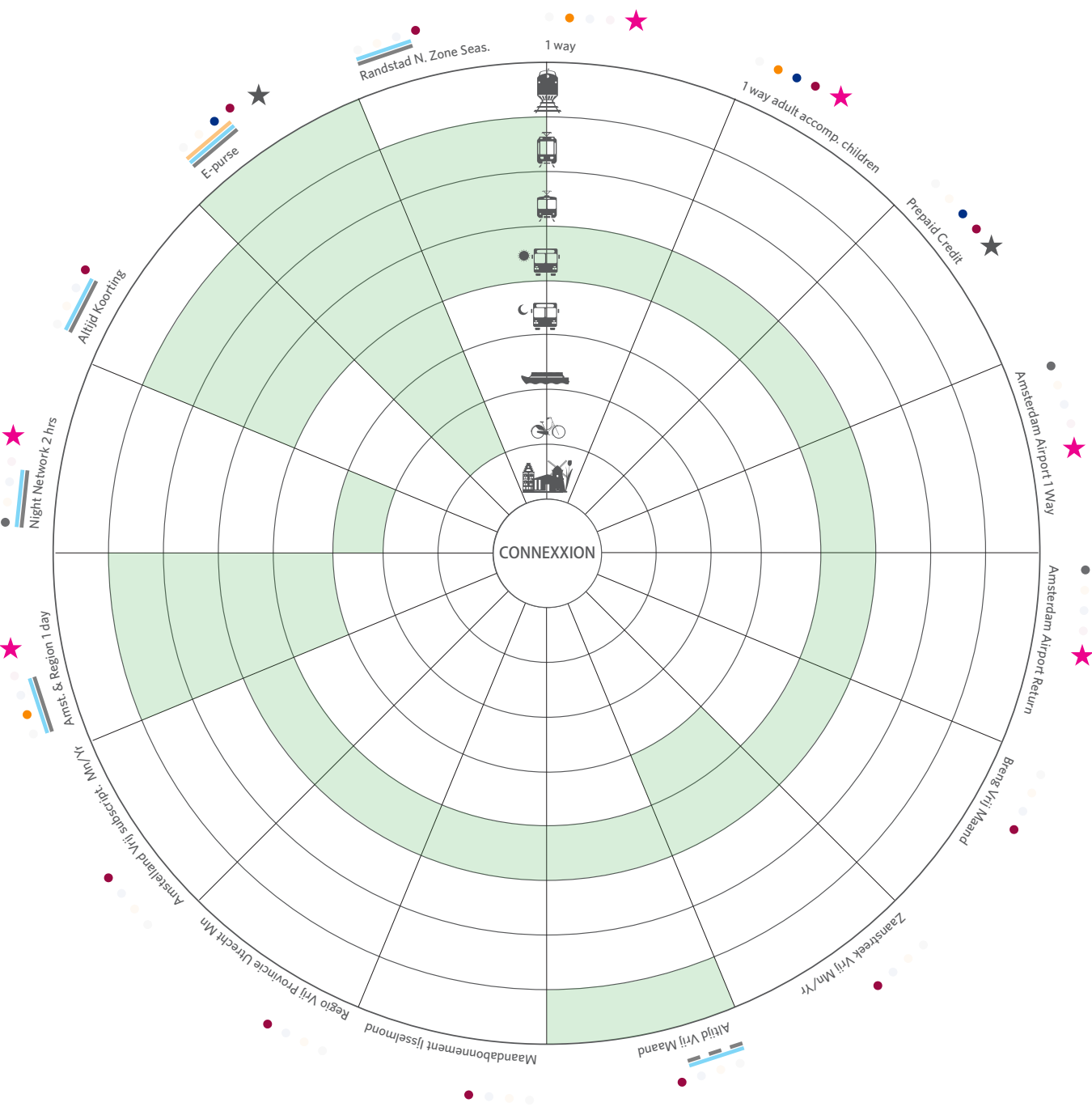
### Visualization

Each circle represents a different company. Rings compose each circle. Each ring represents a different transportation modality, and each segment of the circle represents a ticket, that is why for each company the number segments in the circle vary. Furthermore it is displayed what type of OV-chipkaart is available for each ticket. In this study the following terms will be used to describe the types of tickets within OV-betalen: Personal OV-chipkaart, Anonymous OV-chipkaart, Disposable OV-chipkaart and Paper ticket with no chip. Please note that the "Business OV-chipkaart" is not part of the study's scope. Some tickets are shared products amongst companies, especially amongst GVB and Connexxion, these are marked with a line of the respective company colour. The tickets that are relevant for international travellers in the Netherlands have also been marked with a star. The main thought behind the allocation of relevance is whether the ticket requires a personalized OV-chipkaart or if it is a long season ticket, in that case it was excluded.

### Visualization Legend

	train		night bus		paper card - no chip		shared product with GVB
	tram		ferry		paper OV-chipkaart		shared product with RET
	metro		bike*		anonymous OV-chipkaart		shared product with Connexxion
	bus		attractions		personalized OV-chipkaart		shared product with NS
					very relevant for international travellers		shared product with EBS
					might be relevant for international travellers		shared product with others

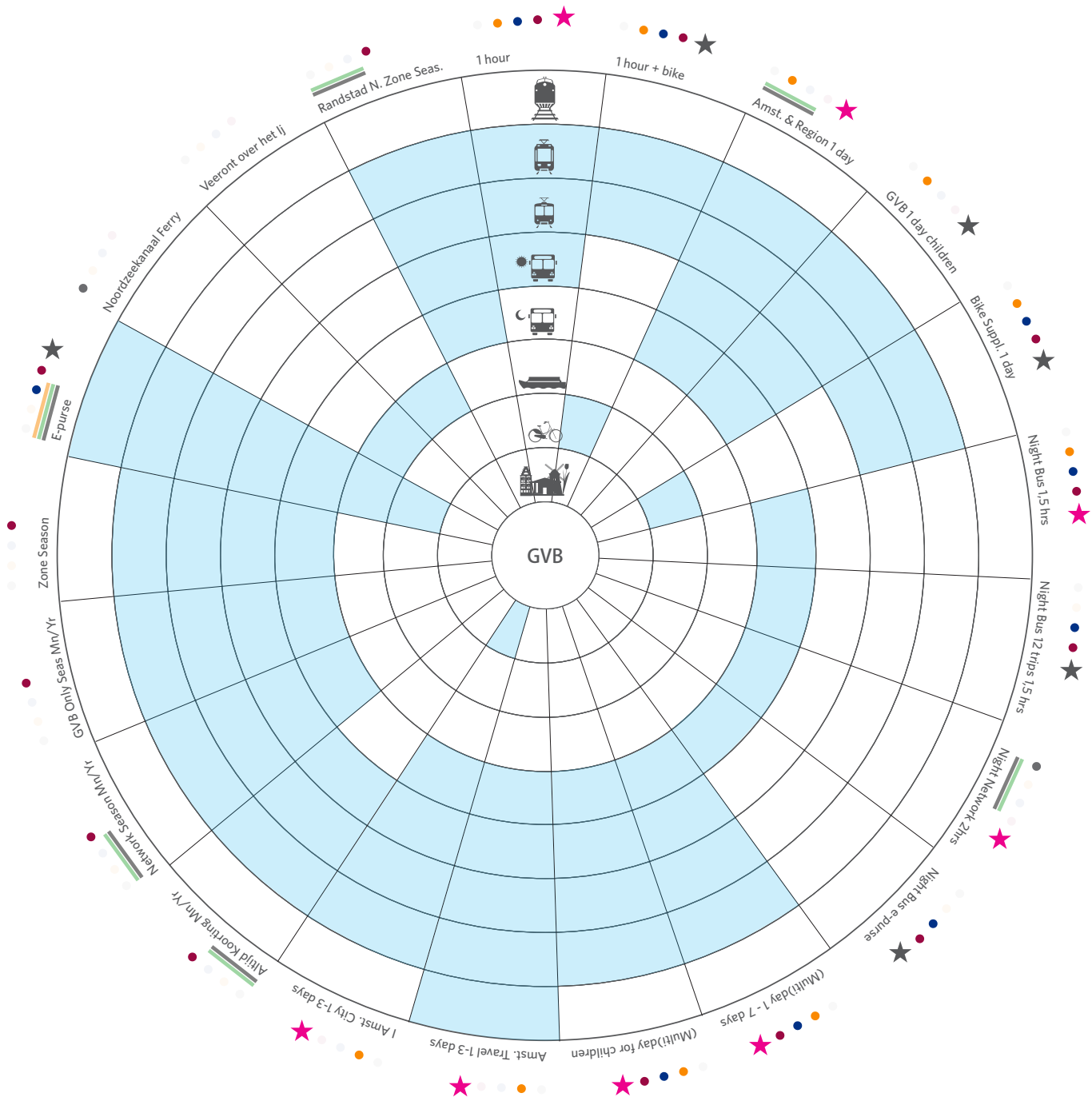
Connexxion Ticket Options





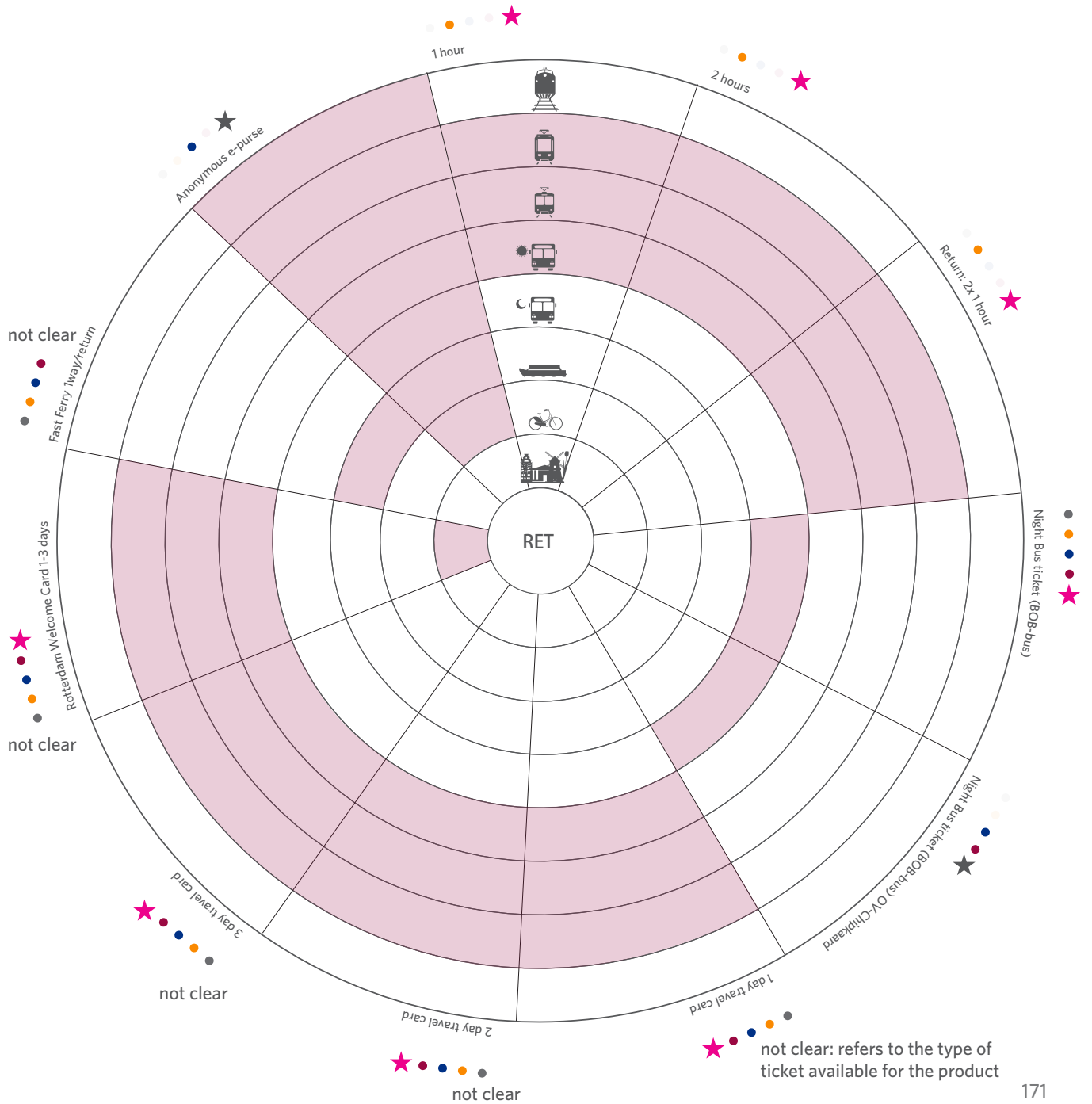
Appendix B - Visualization of available tickets for Connexxion, GVB & RET

GVB Ticket Options



## Appendix B - Visualization of available tickets for Connexxion, GVB & RET

### RET Ticket Options



## **Appendix B - Visualization of available tickets for Connexxion, GVB & RET**

### **Conclusion**

In conclusion it is very apparent that GVB has the most ticket options that are also relevant for international travellers. GVB in comparison to RET, NS and Connexxion also has the most complete descriptions provided in English and Connexxion the least. Every company has a different description of the public transport system and therefore a different description of the OV-chipkaart, which can prove to be overwhelming considering that the description evolves around one single product (the OV-chipkaart). This was addressed during the stakeholder meetings and was responded with the argument that the companies want to provide a full service and dislike the idea of sending their client to another party for an explanation. Overall the information provided is overwhelming, possibly because of the large range of products.



## **Appendix C - Description of the stakeholder organisations for public transportation and international travellers in the Netherlands**

### **1. Travellers**

The travellers are the users of the public transportation and therefore the most important stakeholder of the public transportation and of OV-betalen. Without travellers and their need of mobility there would be no necessity of providing public transportation.

#### **Domestic**

The domestic travellers play a larger role than the international travellers, in the countries' system. There are more domestic travellers than international travellers and they are a long-term stakeholder, while international traveller are usually a short-term stakeholder. Several projects and developments take place constantly to improve the service for domestic travellers. However due to the social responsibility related to public transportation it should be available to everyone in the country, also travellers, who only use it for a shorter period of time or sporadically making this minority the relevant topic of study.

#### **International**

International travellers are important stakeholders of the system, because, "Inbound tourism is a major growth industry within the Dutch economy". (NBTC Holland Marketing, 2015). And a crucial part of travelling is the means of transportation used to get from A to B. International tourism to the Netherlands has increased by an approximate of 40 % from the year 2000 up to 2014. The third main complaint of visitors to the Netherlands is the lacking user-friendliness of public transportation, and it is suggested to improve the smartcard and payment options for travellers. (NBTC Holland Marketing, 2015). Evidently there is room for improvement regarding the Dutch public transport system when it comes to international users. In order to keep tourism in the Netherlands stable and growing it is essential to use this significant opportunity and search for ways to improve the services related to public transportation for international travellers.

### **2. Consumer Organisations**

In the Netherlands several consumer organisations exist. These are usually linked to the domestic travellers, rather than the international ones. The travellers can bring their issues to these consumer organisations. These organisations bring the issues to the authority and to the public transportation operators. According to the "Public Transport Act of 2000" (Wet personenvervoer 2000) the public transportation operators are obliged to meet with the consumer organisations at least once a year, yet not obliged to follow their advice. In some cases this leads the consumer organisation to bring the subjects of matter to the media. Furthermore it is also required to consult with consumer organisations during the concession processes.

### **3. Transportation Organisations**

As this project concerns international travellers arriving via air to the Netherlands, who then use OV-betalen, it is crucial to not only consider their travels with public transportation in the Netherlands, but also to consider the carrier airlines with which they arrive to the Netherlands. Passenger airlines are direct

## **Appendix C - Description of the stakeholder organisations for public transportation and international travellers in the Netherlands**

stakeholders to the international travellers and they present an opportunity to link the travel journeys in different transportation modalities from a sooner stage in the travellers' trip. Furthermore alternatives to public transportation are considered, as they also are direct stakeholders to the international travellers and the relationship between the travellers and these alternatives also can provide valuable insight on the perception and decision making of travellers regarding public transportation.

**Dutch Public Transportation Organisations** The public transportation operators are responsible for delivering transport services. Currently ten companies are responsible of offering public transportation throughout the Netherlands, namely: Arriva, Connexxion, EBS, GVB, HTM, NS, Qbuzz, RET, Syntus and Veolia; of which four, namely Connexxion, GVB, NS and RET are project partners. OV-betalen, specifically the OV-chipkaart, delivers valuable business data in regards to travel behaviour and because the companies are interested in efficient work that reduces cost and increases profit, the data is valuable in terms of showing possibilities for development and optimization. The operators are divided into the national rail (NS) and the regional public transport, which are all the other public transport organisations mentioned. Furthermore Trans Link Systems is a shareholder, together with GVB, HTM, NS and RET, while there also are non-shareholders involved: Arriva, Connexxion, Syntus and Veolia.

### **Passenger Airlines**

Multiple passenger airlines fly to and from Dutch airports. For this project, focus is specifically given to KLM, which is the flag carrier airline of the Netherlands and a project partner. "KLM wants to become the most customer centric, innovative and efficient European network carrier." (klm.com, n.d.) The role KLM is relevant in terms of the services it offers to travellers and the opportunities that exist to address travellers sooner in respect to public transportation. Moreover the way KLM works together with Schiphol airport, which is a main contextual touchpoint for travellers is relevant to the study.

### **Others (rental cars, taxis, private tours, etc.)**

(International) Travellers have access to multiple sorts of transportation when they arrive to the Netherlands. The mobility possibilities include taxis, rental cars, private tours, coaches, bicycles etc. and are related to the purpose the travellers have during their stay in the Netherlands. Considering these mobility possibilities is key during the study in order to have a more complete picture of travellers' needs in terms of mobility and in order to differentiate between the reasons travellers have to use or not to use public transportation.

## **4. Points of entry**

Travellers physically access the public transportation system at stations (or stops in the cases of trams and buses). However as in this study international travellers arriving via air are considered, the airports are also significant points of entry and a major part of the whole travellers journey. Within airports there also are stations, however the workings between stations and airports differ widely per airport.



## **Appendix C - Description of the stakeholder organisations for public transportation and international travellers in the Netherlands**

### **Stations/Stops**

For the purpose of this study, a distinction is made between big stations, small stations and street stops. The number of available modalities and available touchpoints is used to define whether a station is big or small. The number of transportation modalities for a small station and often for stops is one or two and for a big station usually two or more. Moreover a stop is defined as the place at the street designated for the vehicle (usually a bus or a tram) to stop for passengers to enter and exit the vehicle.

Airports: Airports, especially in the case of Schiphol Airport, do not have the characteristic of a regular station or stop. This fact must be considered throughout the study and during the solution development phase as the whole system is intertwined. If suggestions are made to improve the situation at the airports problems cannot simply be shifted to other stations, the whole system must be kept in mind.

### **5. Technology Suppliers**

Technology suppliers are not directly related to the travellers however they are directly related to many touchpoints and other stakeholders for international travellers and public transportation, like the points of entry, to the public transportation organizations, to Translink Systems and to retail. The way technology suppliers work together with other stakeholders when making decisions about the products they are co-creating therefore can influence the experience of the travellers greatly.

### **6. Translink**

Translink manages the payment system in terms of technology, finance and by providing direct customer service. It is “the only service provider for the processing of public transport payments in the Netherlands.” (Translink.nl) It works as the back office responsible for the financial and technological workings of the OV-system. Recently, developing and innovating the system further has become part of its role and contribution. Also it provides customer service directly to OV-chipkaart users, for example through the ov-chipkaart.nl website that offers a range of services to users, who possess a registered card. In 2001, NS, GVB, RET, HTM and Connexxion formed the joint-venture called Trans Link Systems in order to set up a national electronic ticketing system, namely the OV-chipkaart system. (Joppien, Niermeiker, Niks, 2013) Today all public transportation organisations are shareholders of Trans Link Systems.

On their website, Translink describes the OV-chipkaart as a contactless chip card with functions as follows: The plastic card contains a chip, which is invisible and integrated into the card and is able to communicate with the national equipment. They explain that the OV-chipkaarts all offer the same capabilities and can be used with all public transportation companies in the Netherlands.

### **7. Retail**

Diverse forms of retail are connected with (international) travellers and public transportation. Tobacco shops, convenience stores, drugstores and supermarkets are available at many stations and of course at the airports. They can be part of travellers' journey, when for example waiting for their train. Furthermore

## **Appendix C - Description of the stakeholder organisations for public transportation and international travellers in the Netherlands**

hotels are included in this category, which is an important contextual touchpoint for international travellers as many inform themselves and even purchase tickets (like in many hotels in Amsterdam) for their stay at the hotels. Hotels also provide an opportunity for public transportation operators to reach travellers at a convenient location for the travellers if this has not succeeded before for example during the flight or at the airport.

### **8. Dutch Government**

The development and workings of the OV-chipkaart system is closely linked to the way Dutch public transport and politics works. Concessions are granted to the multiple public transportation organisations (currently: Arriva, Connexxion, EBS, GVB, HTM, NS, Qbuzz, RET, Syntus and Veolia) for different areas they are responsible to cover with their public transportation services. The government of the Netherlands explains on it's website, that various parties are involved with the public transport of passengers:

#### **National Government**

The Ministry of Infrastructure and the Environment (I&M) is responsible for laws, rules and policy for the use of the railways. The ministry grants concessions for passenger transport on the main railway network and for railway management. The ministry finances the construction and most of the maintenance of the railway. (Organisation of Public Transport., Government.nl, n.d.) Furthermore I&M also determines who may fulfil the concession on the main railway network and who may manage the railway.

#### **Regional and local governments**

The provinces and urban regions determine which company will handle public transportation in the regions. In some cases the local government will manage the concession deals, like in the case of the GVB in Amsterdam.

### **9: Regulators**

The Regulators oversee if the system managed by the public transportation operators and Translink system remains within the law.

### **10. NOVB**

The N.O.V.B. is a discussion group formed by the (regional and local) governments and authorities as well as consumers and transport operators.

## Appendix D - Stakeholder contacts: interview summary of project partners - & organizational role of interviewees

The role of the project partners (Connexxion, GVB, KLM, NS, RET and Schiphol Group) is to support the research by providing a primary contact that can facilitate the access to company information relevant for the development of the project, like their expert opinion, previous research, pilots or further contacts. At the beginning of the project a meeting was arranged with each project partner separately with the purpose to acquire an understanding of the company's ambitions through the involvement with this project. The following is a summary of the main company's goals and views on the current situation with international travellers is presented. In general the high level goal of the partners is to provide a seamless travel experience to international travellers who arrive via airport to The Netherlands. As mentioned in chapter one it is evident that currently each journey is a separate entity for the travellers and that by providing a travel flow amongst operators the transition from air to ground and within the ground from location to location would smoothen and consequently improve the whole service and therefore the whole user experience. However the partners all have different concerns regarding their own companies and are aware that the implementation of solutions comes with financial decisions that might make or break the realization of solutions. The willingness to improve the situation is given, but the way to improve is not clear, hence this project will provide guidance to the businesses in terms of developing user-centred solutions. The following descriptions illustrate the relevance of this project each of the project partners an highlights joint and individual concerns.

Connexxion: Due to the operational area of Connexxion (Amsterdam Meerlanden, the broad region of Schiphol, the surroundings of the city of Amsterdam, Zaanstreek and Almere), which is large touristic point, a growth opportunity for the company is given in terms of providing a better service to international travellers. Connexxion would like for the public transportation to provide information about public transport in general and not only tell the travellers about their own public transportation companies in order to provide the travellers with more transparent public transportation information in general.

GVB : As a matter of fact most of the international travellers (almost 40%) that arrive to the Netherlands visit Amsterdam. GVB's goals consist of reaching international travellers earlier, meaning that they should be able to buy their public transportation tickets earlier in their journey. This would partly solve the problem that the people are buying tickets in vehicles. This is an issue for the GVB, as the drivers are selling tickets instead of leaving on time, the schedule gets delayed and this causes congestions. According to the GVB reaching people at the airport (rather than before their trip on a GVB vehicle) would only succeed if it is easy enough for the user to obtain the tickets there.

KLM: KLM recognizes the urge to improve the whole trip of the passenger, as the entire journey should be optimized and realizes that involving the further trip of the passenger in their services will create some sort flow in the passenger's journey, which will improve the passenger's view on the airline. Identifying the needs of the passengers on an earlier stage of their journey should smoothen the course of the customer's journey and KLM could potentially play an important role in facilitating this before the passenger is lost

## **Appendix D - Stakeholder contacts: interview summary of project partners & organizational role of interviewees**

on the public transport system, which in many cases begins arriving at the airport. Currently there is no smooth hand over or connection between the airline and the airport nor other transportation companies, making the topic of international travellers and public transportation an incentive for the company.

NS: NS is the largest public transport operator in the Netherlands and covers the whole country with train services. As a company they have the most concessions and therefore a great responsibility within the country. Furthermore they have to communicate and collaborate with the other nine public transportation companies in the country. In general NS has to look more at the big picture and believes that the public transportation system should provide a solid alternative to using a car for mobility within the Netherlands and NS believes that by providing a “seamless experience” to the users they will be more drawn to the using the system than otherwise. By servicing international travellers in a more optimal way NS could profit from travellers using their services around the whole country and not only around the touristic hotspots like Amsterdam, which also is a goal from NBTC and therefore supported by the government.

RET: For RET the target group of international travellers is relevant because of the Rotterdam – The Hague airport in their transport region. The airport is only directly connected to any of the cities by bus, and then the travellers can take other public transportation vehicles. At the airport when one airplane arrives cues build up at the bus and ticket vending machines. Rotterdam does not have a history of tourism like Amsterdam does, therefore the RET works closely with the VVV, the Rotterdam welcome organization. For RET it is important to approach the travellers earlier in the process of buying a ticket and for the traveller to see the options offered in order to buy the best ticket and not only the one way ticket to the central station, usually the one hour ticket.

Schiphol Group: In the Landside Access department the main objective is to take care of getting the passengers to and from the airport. Going to and from the airport is part of the customer’s whole travel experience . The focus for Schiphol Airport is set on the passengers, who when satisfied will help the business to thrive, but also on sustainability and the impact a better public transportation system will provide.

**Appendix D - Stakeholder contacts: interview summary of project partners  
& organizational role of interviewees**

**The Netherlands**

Connexxion	Manager Regiecentrum Openbaar Vervoer (Control centre Public Transport)
GVB	Business Anaylsi, Project Manager
GVB	Manager Sales & Service
GVB	Vertegenwoordiger Zakelijke Markt (Business Market Representative)
KLM	Manager at Product Development
NS	Business manager TLS at Nederlandse Spoorwegen
NS	Multichannel Manager Selfservice Stations
NS Stations	Senior Researcher
NBTC	Communicatie & Public Affairs (Communication & Public Affairs)
NBTC	Senior Marktonderzoeker (Senior Market Researcher)
RET	Productmanager OV-chipkaart at RET
RET	Coordinator of OVCP
Schiphol Airport	Manager Landsie Access

## Appendix D - Stakeholder contacts: interview summary of project partners & organizational role of interviewees

### London

TFL      Service Delivery Manager, Customer Experience Directorate

### Hong Kong

Dutch Embassy      Senior Commercial Officer, Consulate General of the Kingdom of the Netherlands

MTR      Manager - Engineering Planning

MTR      Manager - IECC Network

Octopus      Deputy General Manager, Sales and Marketing Department

Octopus      Deputy General Manager, Technical Department

### Denmark

Copenhagen Airport      Business Specialist, Landside Infrastructure, Customer Care

Copenhagen Metro      Chairman Working Group for Tourist and Event Products in the Greater  
Copenhagen Region, Commercial Development & Partnership Consultant

DTU      Professor at Traffic modelling and planning

DTU      Data- and Modelcenter (previously position at Movia)

DTU      Assistant Professor, Traffic modelling and planning

DTU      PHD Student, Traffic modelling and planning

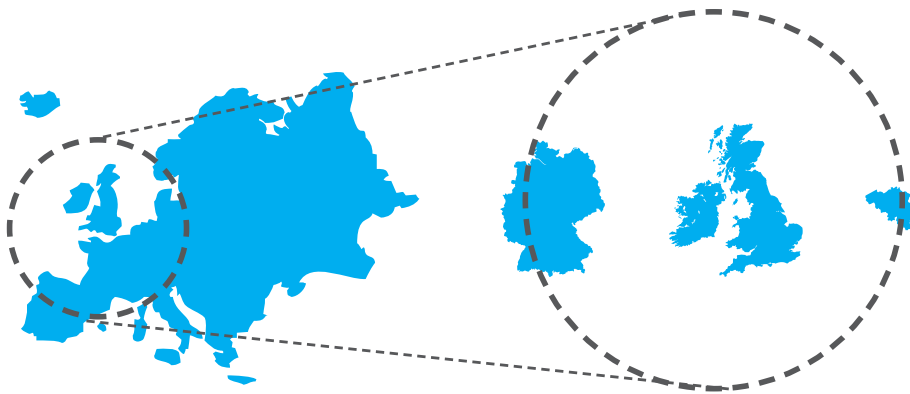
Rejsekort      Senior Advisor, Rejsekort A/S



**Appendix E - Infographic representing the most relevant facts for the study in regards to inbound tourism retrived from the NBTC Holland Marketing report (2014)**

## International Travellers in the Netherlands

Where do they come from?

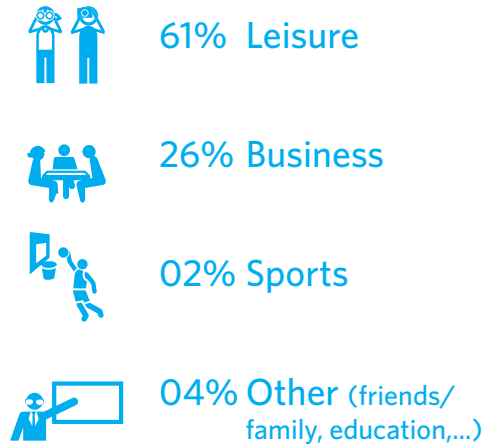


80% from Europe, most visitors from:  
Germany, United Kingdom and Belgium

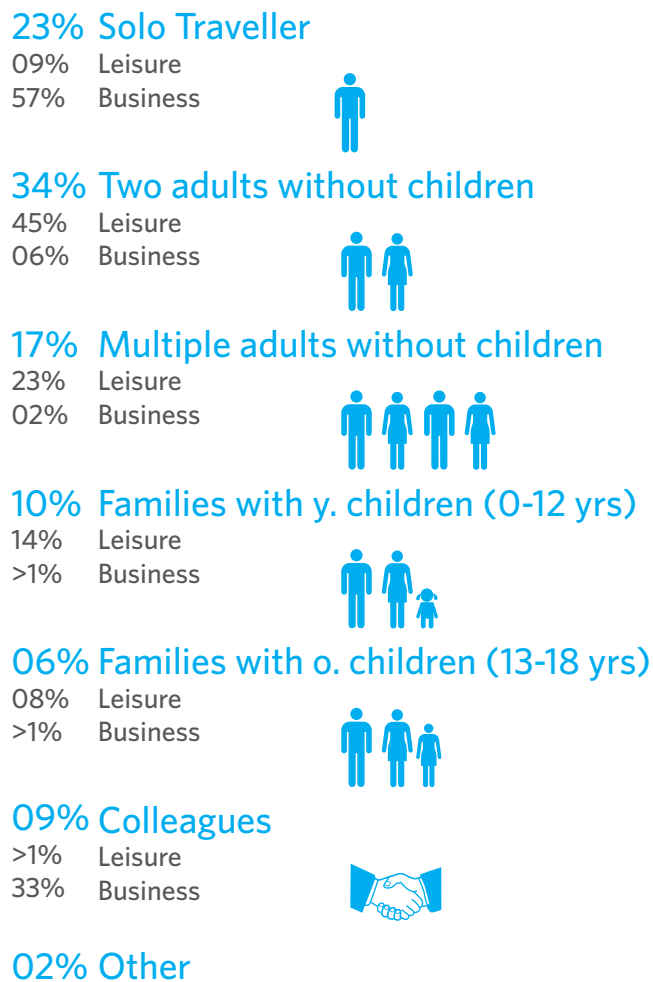


1/5 is not a European visitor

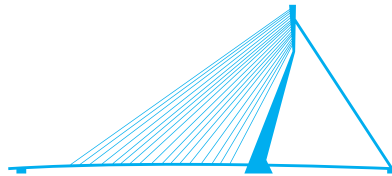
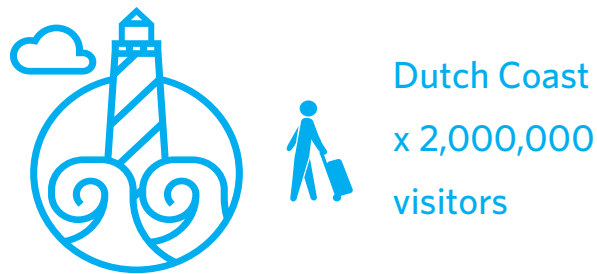
## Why do they visit?



## With whom do they travel?



Where do they go to?



25% visit further big city  
Eg. Visits to Rotterdam or The Hague



20% visit further attractions  
Eg. Visits to Keukenhof or Zaanse Schans

## What are the most common activities?



## How do they travel to the Netherlands?



44% Airplane



40% Own/rented car



08% Train



03% Coach

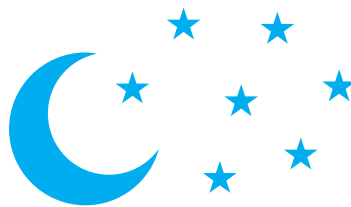
04% Other

96% Arrivals in  
regional airports

4% Arrivals  
in Schiphol Airport



## How long do they stay?

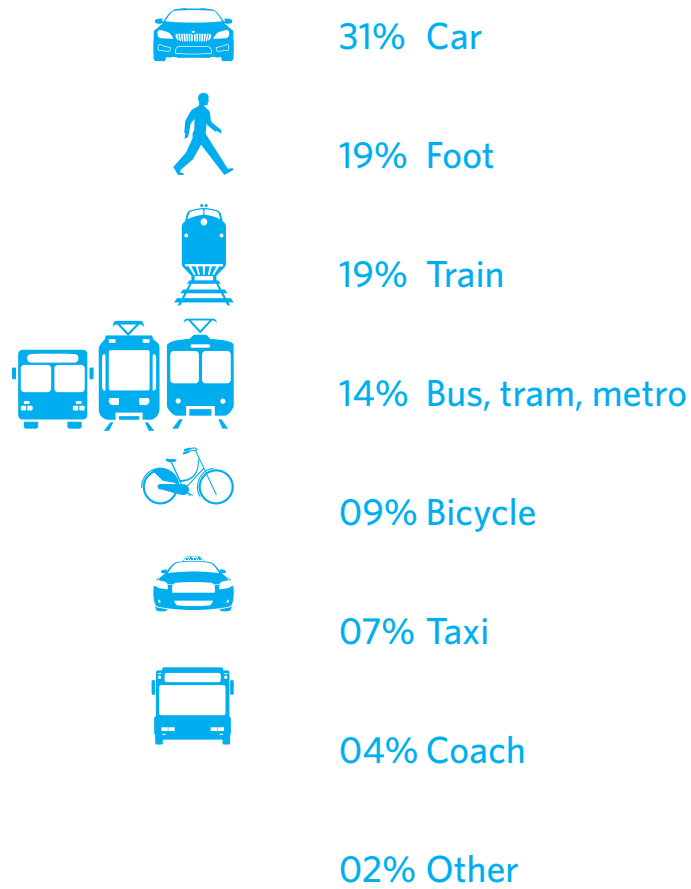


> 50% stay 1 - 3 Nights

1/3 stay 4 - 7 Nights

>08% stay 8 Nights +

## How do they travel in the Netherlands?





## How do they search & book?



87% use the internet as  
their main source of  
information



50% use apps related  
to their destination

## What do they search & book online?



69% Accommodation Providers



31% Attractions, Museums,...



29% Carriers



25% Cities/Regions



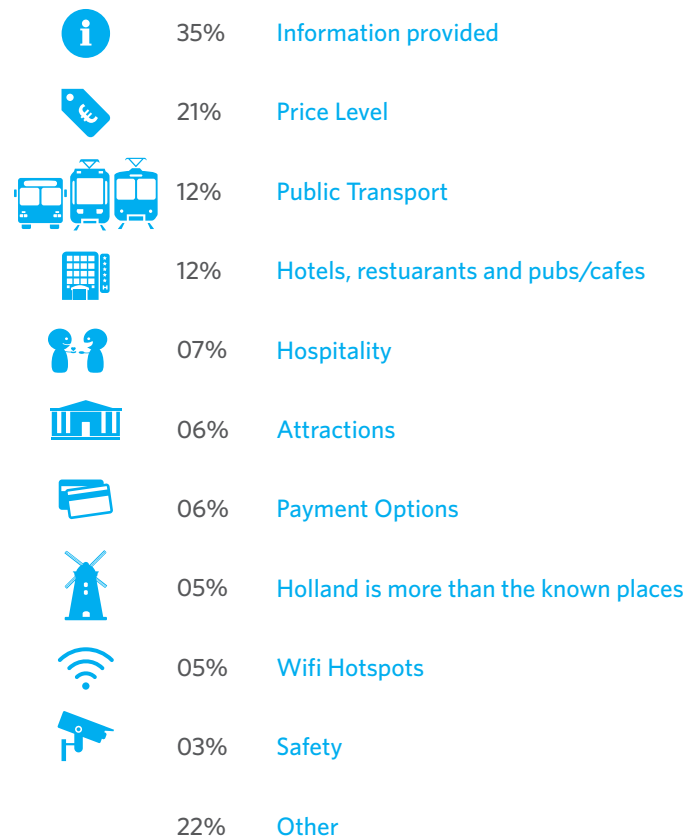
20% About the Netherlands



11% Travel Organisations

17% Other

What are their suggestions for making Holland even more attractive to foreign tourists?



“

„The third main suggestion for improvement relates to public transport. Many international visitors perceive public transport as non-user friendly. The main reasons for this perception are their difficulties with the public transport smart card and how to pay for tickets. There is also room for improvement regarding the information provided on means of public transport. Visitors indicated that the information is often not clear, or not in English or their own language.“

## Appendix F - Method: Interview guidelines

### Interview guide: international travellers, who are public transportation users

Introduction: I am student from the TU Delft, in the Netherlands, and for my master thesis I am doing research about the usage of public transport systems, specifically e-ticketing. Do you mind if I ask you a few questions about your experience as a traveller using public transportation?

- Where are you from?
- How did you travel to \_\_\_\_\_?
- How did you travel from the airport to the city?
- Where did you buy your public transportation ticket?
- (How) did you inform yourself before arriving in \_\_\_\_\_ about the ticket you want to buy?
- What expectations about the public transportation system did you have before arriving here?
- How was your experience buying the ticket (service personnel, ticket vending machine, internet, other)?
- What was the hardest?
- What is your general opinion about the system?

### Interview guide: service personnel

Introduction: I am student from the TU Delft, in the Netherlands, and for my master thesis I am doing research about the usage of public transport systems, specifically e-ticketing. Do you mind if I ask you a few questions about the things you experience with the travellers?

- What does your job consist of here?
- How long have you been working here?
- Do you help many international travellers regarding the usage of the system?
- With what do you help them specifically?
- What are the main differences in the usage of the system between locals and international travellers?
- Have there been changes in the system since you work here?
- How do you think the system could improve?

**Interview guide: Dutch Project Partners**

- Introduce myself
- Introduce the Master DFI/design focus we have
- Describe project in my own words
- Please introduce the company in a few sentences.
- Please introduce yourself and your role here at the company.
- Considering the brief, what are your expectations for the project?
- What things are currently being done regarding
  - International travellers at the company
  - Ticket options
  - Payment methods
- Do you have material (statistics eg. Demographics/Usage/common mistakes/problems) about usage of the ticket products offered?
- Where do you think that problems might arise through the process of this project?
- Whom else can I talk to about these issues within the company and the wider field?
- Suggestions for benchmark & reason.

**Stakeholders Abroad**

- Introduce myself
- Introduce the Master DFI/design focus we have
- Describe project in my own words: The project consists of ...
- For me it is interesting to gain insight on the way other systems work in order to broaden my perspective and be able to identify processes, products, services, strategies or anything that could lead to improvement.
- How relevant is the topic of international travellers for you?
- Is there any social and/or political pressure about the topic of international travellers and the public transportation system?
- How do you address international travellers regarding your public transportation system?
- How do you provide information about the system and ticket options to international travellers?
- How do/did you decide on the options the international travellers have?
- Do you encounter problems with international travellers using the system?
- What problems do you encounter? Why do you think this is? Do you have/ What are your plans to solve this issues? ---> Refer to payment
- What are the differences between locals and international travellers for your business?
- How are you currently dealing with this pressure?
- What technological development do you foresee for the system?

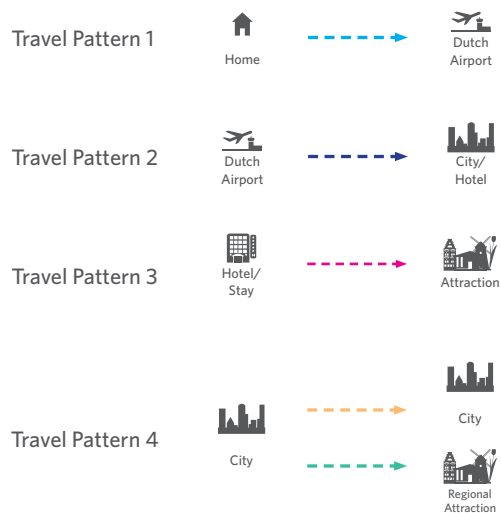
## Appendix G - Method: Overview of sample locations for field research

The following tables provide an overview of specific locations selected to carry out field research. These are referred to as sample locations and are based on the established context of use and the defined relevant travel journeys for international travellers arriving via airport to The Netherlands. The selected locations are key parts of the established travel patterns (chapter 3: travel from home country to Dutch airport, travel from Dutch airport to city/hotel, travel within the city and travel outside of the city). Naturally the different locations are related to the public transportation system via public transportation stations and stops, which make the locations accessible for the travellers. For this study not only specific locations are selected to carry out field research, but stations and stops themselves are selected as research locations.

A distinction is made between big stations, small stations and street stops. The number of available modalities and available touchpoints is used to define whether a station is big or small. The number of transportation modalities for a small station and often for stops is one or two and for a big station usually two or more. Moreover a stop is defined as the place at the street designated for the vehicle (usually a bus or a tram) to stop for passengers to enter and exit the vehicle.

### Travel patterns

(established in chapter 3)



## Appendix G - Method: Overview of sample locations for field research

Amsterdam									
Description		Sample Location							
		Airport Amsterdam Schiphol	Central/Largest Station Amsterdam Central	Multi-modal Station Amsterda Zuid	City Attraction 1 Rijksmuseum	City Attraction 2 Anne Frank Huis	Outside of the city	Hotels	Information Desks
Station (Size)	s	■	■	■	■	■	■	■	■
	l	■	■	■	■	■			
Stop	-	■	■	■	■	■			
Number of p.t. transport modalities	1	■	■	■	■	■			
	2	■	■	■	■	■			
	2+	■	■	■	■	■			
Service personnel	yes	■	■	■	■	■		■	■
	no	■	■	■	■	■		■	■
Travel Pattern #	-	1, 2	1, 2, 3, 4	3	3	3	4	2, 3, 4	1, 2, 3, 4



## Appendix G - Method: Overview of sample locations for field research

Rotterdam									
Description		Sample Location							
		Airport Rotterdam The Hague	Central/Largest Station Rotterdam Central	Multi-modal Station Rotterdam Blaak	City Attraction 1 Museum B. v. Beuningen	City Attraction 2 Markthal	Outside of the city	Hotels	Information Desks
Station (Size)	s	■	■	■	■	■	■	■	■
	l	■	■	■	■	■			
Stop	-	■	■	■	■	■			
Number of p.t. transport modalities	1	■	■	■	■	■			
	2	■	■	■	■	■			
	2+	■	■	■	■	■			
Service personnel	yes	■	■	■	■	■			■
	no	■	■	■	■	■			■
Travel Pattern #	-	1, 2	1, 2, 3, 4	3	3	3	4	2, 3, 4	1, 2, 3, 4

## Appendix G - Method: Overview of sample locations for field research

London									
Description		Sample Location							
		Airport London Heathrow	Central/Largest Station Victoria, Paddington	Multi-modal Station King's Cross	City Attraction 1 British Museum	City Attraction 2 London Eye	Outside of the city	Hotels	Information Desks
Station (Size)	s	■	■	■	■	■	■	■	■
	l	■	■	■	■	■			
Stop	-	■	■	■	■	■			
Number of p.t. transport modalities	1	■	■	■	■	■			
	2	■	■	■	■	■			
	2+	■	■	■	■	■			
Service personnel	yes	■	■	■	■	■		■	■
	no	■	■	■	■	■		■	■
Travel Pattern #	-	1, 2	1, 2, 3, 4	3	3	3	4	2, 3, 4	1, 2, 3, 4

## Appendix G - Method: Overview of sample locations for field research

Hong Kong									
Description		Sample Location							
		Airport Hong Kong International	Central/Largest Station Hong Kong Central	Multi-modal Station Yuen Long	City Attraction 1 Victoria Peak	City Attraction 2 Ngong Ping	Outside of the city	Hotels	Information Desks
Station (Size)	s	■	■	■	■	■	■	■	■
	l	■	■	■	■	■			
Stop	-	■	■	■	■	■			
Number of p.t. transport modalities	1	■	■	■	■	■			
	2	■	■	■	■	■			■
	2+	■	■	■	■	■			
Service personnel	yes	■	■	■	■	■			■
	no	■	■	■	■	■			■
Travel Pattern #	-	1, 2	1, 2, 3, 4	3	3	3	4	2, 3, 4	1, 2, 3, 4

## Appendix G - Method: Overview of sample locations for field research

Denmark									
Description		Sample Location							
		Airport Copenhagen	Central/Largest Station Copenhagen Central	Multi-modal Station Nørreport	City Attraction 1 Little Mermaid	Attraction 2 Kronborg Castle	Outside of the city	Hotels	Information Desks
Station (Size)	s	■	■	■	■	■	■	■	■
	l	■	■	■	■	■			
Stop	-	■	■	■	■	■			
Number of p.t. transport modalities	1	■	■	■					
	2	■	■	■	■	■			■
	2+	■	■	■	■	■			
Service personnel	yes	■	■	■	■	■			■
	no	■	■	■	■	■			■
Travel Pattern #	-	1, 2	1, 2, 3, 4	3	3	3	4	2, 3, 4	1, 2, 3, 4

## Appendix H - Method: Overview of all cases considered for the benchmark

Place		Public Transportation Sytem										Airport			Tourism		Other				
Continent	City	E-ticketing system	Validity area	Modalities of public transport A: p. t. to and from airport					Number of operator(s)		Contact with local stakeholder			Size by int. travellers		Distance to city			Tourism numbers		
				Train	Tram	Metro	Bus	Other	One	Various	Yes	Maybe	No	Ranking Data (top 30)	No ranking data	0 - 10km	10 - 25km	25km +	Ranking Data (top 10)	No ranking data	
	Amsterdam	OV-chipkaart	whole country		A		A			10				5th			18 km				
	Copenhagen	Rejsekort	whole country	A		A	A			5				22nd		7.5 km					Nr. 1 European airport in ground transportation
	Dubai	Nol Card	Dubai			A	A							1st		5 km			4th		
	Hong Kong	Octopus	Hong Kong	A			A							3rd				35 km	10th		
	London	Oyster	greater London	A		A	A							2nd* <sup>1</sup>				32 km* <sup>1</sup>	1st		
	New York	SmartLink	N.Y.C. & northern New Jersey											17th* <sup>2</sup>				27 km* <sup>2</sup>	6th		
	Oslo	Flexus	greater Oslo	A			A											49 km* <sup>3</sup>			
	Rotterdam	OV-chipkaart	whole country				A			10						8 km					
	Seoul	T-money	Seoul metropolitan area	A		A	A							8th* <sup>4</sup>				27 km* <sup>4</sup>	9th		
	Singapore	EZ-Link	whole country	A			A							6th			20 km		7th		
	Tokyo	Suica	greater Tokyo	A			A							15th* <sup>5</sup>				68 km* <sup>5</sup>			
	Toronto	PESTO	greater Toronto/ Hamilton area/ Ottawa	A		A	A			8				23rd			25 km				8 companies working together, good comparison to 10 Dutch

Europe  
Asia  
Americas

Dutch Research Cities  
Benchmark Research Cities

\*1 London: Heathrow  
\*2 NYC: JFK - find transport to airport  
\*3 Oslo: Gardermoen  
\*4 Seoul: Incheon  
\*5 Tokyo: Narita





## Appendix I - Method: Description of each topic to assess the findings for the cross-case analysis of the benchmark

After clustering the statement cards five main topics relevant to international travellers experiences using public transportation surfaced. The five topics are:

1. Choice of transportation
2. Searching information
3. Ticket selection
4. Ticket purchase at ticket vending machine
5. Public transportation usage

Each of these four topics has subtopics and the subtopics are split into properties. The properties are formed through the insights obtained during the research and are discussed in detail in the chapters 7 and appendix L. The following definitions of the topics, subtopics and properties are used thought the study and analysis of the research cases.

### Topic 1: Choice of transportation modality

International travellers face multiple options in regards of mobility when travelling aboard.

The qualities travellers consider or search for when selecting the type of transportation modality provides insight in the understanding of their selection processes, needs and perceived importance of qualities. The subtopics of this topic category are Selection by convenience factor and Selection based on experience.

#### Selection by convenience factor

What is convenient for one traveller might not be convenient for another, however the types of properties of transport travellers perceive as convenient and influence the selection of transport modality are assembled as follows: Accessibility, Comfort, Distance and Efficiency.

- Accessibility: Accessibility refers to having the option to use a transportation modality at a specific time or in a specific place. Some of the interviewed users mentioned their flight's late arrival time as an important factor when selecting their transportation method from the airport to their stay.
- Comfort: Comfort is related to the perceived wellbeing of the user when using a specific type of transportation. In some cases users mentioned the transportation of luggage as an influencing factor in terms of comfort with certain transportation modalities.
- Distance: The distance between locations is relevant to travellers when selecting the type of transportation and in many cases it was mentioned that walking is preferred on short distances.
- Efficiency: Efficiency is related to the aspect of time and getting form one place to another as quickly or within as little time as possible.

## **Appendix I - Description of each topic to assess the findings for the cross-case analysis of the benchmark**

### **Selection based on experience**

Some travellers select their transportation modality based on what they have experienced in the past when using different transportation modalities. Often generalisations and assumptions are created by these experiences that make the users act in a certain way in other cases experiencing something in the moment of use causes travellers to choose one or the other transportation modality, hence the two properties of this subtopic are Public transportation assumption or bias and Failed attempt to use public transportation.

- Public transportation assumption or bias: It became evident that in some cases users have assumptions about public transportation, which cause them to act in a certain pattern, without the assumption being correct.
- Failed attempt to use public transportation: This property is dedicated to travellers who tried to use the public transportation system but did not succeed for different reasons and opted to use a different transportation way.

### **Topic 2: Searching Information**

International travellers constantly search for information through their whole travel journey, especially as most of them are not familiar with the context they are in, nor familiar with the workings of the public transportation system they intend to use. This topic category provides insight on the type of information travellers require, where travellers search for the information and how the way that information provided assists the travellers. Within this topic category there are four subcategories, namely searching information in regards to Service personnel, Public transportation signage, Spatial orientation and Language-related problems.

#### **Service Personnel**

This subtopic provides information about the type of information travellers request from service personnel, Type of information requested, where the service personnel is approached at, Location of assistance, and how the way the information is provided by the personnel affects the travellers journey and experience with public transportation, Way of information providing. Furthermore it provides the insight that some travellers prefer to ask service personnel for answers than search by themselves, User assumption "asking the service personnel is best".

- Type of information requested: The type of information requested by travellers from public transportation service personnel does not only concern the public transportation service provided by the public transportation company, but includes all sort of other request regarding other transportation companies, the location of places or general touristic information.
- Way of information providing: Situations experiences, observed and described by users made evident

## **Appendix I - Description of each topic to assess the findings for the cross-case analysis of the benchmark**

that the way information is provided by service personnel can not only influence the travellers journey but his understand and perception of the public transportation in the respective city/country.

- Location of assistance: The location at which the service personnel is available and approached provides insight about travel patterns regarding the moments at which international travellers require information and the (dis)advantages of providing assistance at specific locations.
- User assumption "asking the service personnel is best": Mainly interviews with international travellers themselves, but also with service personnel provided the insight that no matter how many means are provided by the public transportation companies to facilitate self-service travellers in many cases prefer to talk to the service personnel, even without trying to use the products and services independently first.

### **Public transportation signage**

Signage is one of the main communication methods used by public transportation companies to inform travellers about diverse matters regarding the usage of the system, especially during the phase of public transportation usage. This subtopic provides insights in respect to information not understood by the travellers, Unclear signage, the effects of the style in which the information on the signage is communicated, Signage style, the locations at which information is provided, Signage location, and also the Amount of information provided and how these affect the travellers.

- Unclear signage: In some cases signage is provided, however travellers do not understand or misunderstand the information communicated and their journey is affected.
- Signage style: The style of the signage often affects the way the information is perceived and understood by the travellers hence it is a relevant aspect to consider when studying international travellers experience with public transportation.
- Signage location: The location of the signage is crucial, as it influences certain patterns of use and the flow of the travellers' journey.
- Amount of information: The amount of information provided to travellers can help them or confuse them more, as when too much information is provided finding the needed information might be challenging and when too little information is provided the travellers might find themselves lost or unable to independently keep using the public transportation system, therefore insight on these extremes help to understand what the travellers perceive about the quantity of information on signs.

### **Spatial Orientation**

International travellers usually are not familiar with the context in which they are travelling therefore

## Appendix I - Description of each topic to assess the findings for the cross-case analysis of the benchmark

must constantly figure out where they are and where they need to go the main purposes of using public transportation is getting from location A to location B. The field research provided information on the methods travellers use as a tool to help themselves orientate. Often travellers illustrated how significant and useful having a smartphone with internet access or using Google Maps was to their travels. Furthermore the information provided by Public transportation maps plays an important role as well as the Mental state in which travellers are when searching spatial information.

- Google Maps/Smartphone usage: Mainly through user interviews, but also through own experience it became evident that international travellers often use their smartphone and specifically Google Maps to find the way when travelling, giving insight about the advantages and disadvantages on this method of orientation.
- Public transportation maps: It is a fact that international travellers often use the maps provided by public transpiration companies to orientate and find their way. The way travellers use the distinctive types of maps provides insight on the effects the different types have on travellers.
- Mental state: User interviews and own experience provided the insight that the mental state at different moments of travels influences the travellers journey especially during first time use as the travellers are completely unfamiliar with the context of use.

### Langue problems

It was noted that in some cases misunderstandings in respect to searching information can occur due to language inaccuracies, like is the case with the Confusion between modality types that some users manifest. In other cases English does not see to suffice as a “universal” communication language.

- Confusion between modality types: In some cities/countries various modalities offer public transportation services, often a misconception of the transportation vehicles, in specific trains, trams and sometimes metro is miscommunicated through language as the terms for one type of transport and used for another, especially causing struggle between travellers and personnel.
- English insufficient: It was communicated by service personnel that in some cases they are unable to help and they and the travellers must go beyond language into other forms of expression to be able to help travellers.

### Topic 3: Ticket selection

The selection of tickets is based on multiple aspects. This topic cluster points out relevant aspects of selection that travellers consider to select one type of ticket over another providing insight on the needs and priorities of travellers during their travels. One of the subtopics illustrates specific Reasons for the

## **Appendix I - Description of each topic to assess the findings for the cross-case analysis of the benchmark**

choices and the other exposes Other influencing selection factors within the selection process of travellers.

### **Reason**

What is reasonable for one traveller might not be convenient for another, however the explanations of ticket properties that travellers provide as convenient and influence the selection of ticket type are clustered within this subtopic, namely Length of stay, Price and Extra Benefits.

- Length of stay: One of the most striking insights in regards of ticket selection ,mostly provided by user interviews, is that travellers do not see the value in purchasing an electronic ticket as it is perceived as too complex to “enter” a system for a short stay, usually a few days.
- Price: The price of public transportation tickets is a factor that influences the ticket selection, but in many cases with the consequence of altering the travellers choice to another transportation modalities. Some travellers, especially ones travelling in groups compare the convenience of public transportation and other options as the price difference does not make public transportation more attractive, providing the insight that the value for money seen in public transportation is altered.
- Extra benefits: In general the travellers who purchase “tourist tickets” are satisfied with the extra benefits, which vary form location to location, but usually offer discounts or free entrances to certain attractions. The insight related to this category is the satisfaction level of the travellers for the offer of this type of ticket.

### **Other influencing selection factors**

- “Non-selection”: Visiting friends/family: Through the field research a pattern regarding international travellers, who are visiting friends or family in the city/country use public transportation as much as other types of travellers, however do not select the type of tickets, and for that matter the type of transportation they use themselves. The striking insight regarding this group that they are a hybrid in regards of the usage of public transportation as they are unfamiliar with the system but guided by a user, who is more familiar with the system.
- Selection through service personnel advice: Several international travellers purchase their tickets after asking for advice from the public transportation staff. This aspect provides insight in regards of the selection phase of tickets and how choices can be influenced by the public transportation organisations, providing opportunities when thinking about improvements for the travellers’ journey.
- Operator complexity/compatibility of tickets: In several cases it became evident that ticket selection is influenced by the complexity of the system, especially when travellers had to use more than one public transpiration organisations services to fulfil their travels.

## Appendix I - Description of each topic to assess the findings for the cross-case analysis of the benchmark

- Moment/Location of journey: Ticket selection and purchase is often influenced by the moment in which travellers decide to buy tickets and therefore by the physical location they are in. This provides insights on how touchpoints available at that moment affect the travellers ticket selection and purchase.
- Selection based on previous knowledge: Understanding the way travellers interact with the public transportation systems' touchpoints when they have previously informed themselves about the system and tickets provides valuable insight on how to optimize information providing and in what sense it is useful for the travellers and the system.
- Selection without previous knowledge: The way travellers select tickets, when they have no previous knowledge about the public transportation system nor the ticket options available provides insight on the aspects they consider on the spot and the important factors that make their selection and purchase process satisfactory in regards of their travels.

### Topic 4: Ticket purchase at ticket vending machine

Due to the nature of the study a fair amount of research was executed regarding ticket vending machines, as they are an important touchpoint within international travellers' journey, who purchase their public transportation tickets at these. Several usability problems were observed and summarized into the following subtopics: Ticket vending machine interface, Payment method and Technological Issues.

#### TVM Interface

This subtopic describes the types of usability problems travellers experienced when interacting with the ticket vending machine, which in most cases concern the Ticket names/information or benefits not being clear to the travellers or unsuccessful usage due to unclear use cues. It must be noted, that this category for the largest part only provides information about the ticket vending machines in the Netherlands and not of all research locations.

- Ticket names/information or benefits not clear: It became apparent that the travellers often did not clearly understand the terminology used for ticket names or did not clearly understand the information provided at the machines, providing insight on the aspects of the information and communication that could be further analysed and improved to improve the travellers' experience with the usage of the machines.
- (Unclear) use cues: In some cases users try to do something that does not result in what they expected, are not sure of how to interact with the machine or simply use the machine in a way that is not intended, giving insight on the aspects of the interface that clearly communicate what the users require to interact properly with the machine and the aspects that do not do so.



## **Appendix I - Description of each topic to assess the findings for the cross-case analysis of the benchmark**

### **Payment method**

The subtopic Payment method communicates problems that traveller experience at the moment of payment for their tickets at the ticket vending machines. These experiences manifest themselves through the following aspects: when the Bank or credit card is declined by the ticket vending machine, when travellers do not have coins available but only paper money. In the Dutch case also when the OV-chipkaart reader and the bankcard reader location are not clear to the user.

- Bank/credit card declined: Ticket vending machines are programmed to accept certain types of cards causing problems to some users who intended to pay with a specific card. The insights provided by this situation are concerning the way travellers experience this situation and the way they react to it presenting opportunities for improvement at this specific touchpoint.
- No coins available, only paper money: Ticket vending machines are programmed to accept certain types of payment, when it comes to cash payment often only coins can be introduced to the machines causing trouble for some users, who intended to pay with paper money. The insights provided by this situation are concerning the way travellers experience this situation and the way they react to it presenting opportunities for improvement at this specific touchpoint.

### **TVM Technological issues**

Certain issues that travellers experience were related to failures in technology, however these types of failures are not necessarily related to the way international travellers interact with the system, but could happen to all sorts of users.

### **Topic 5: Public transportation usage**

When international travellers come in contact with the public transportation system they experience through multiple touchpoints. In some cases the First time use of the system is the most striking, as it is the base on which travellers continue to interact with the system and also technological issues that affect a seamless usage.

#### **First time use**

First time use in this case addresses instances when the users experience a Lack of usage information and how the Feedforward affects traveller usage of the system and the travellers' experience.

- Lack of usage information: In some cases information, which users are not "just meant to know" is not provided and understanding what is the content of this essential information missing and when it is relevant for in the travellers journey are valuable insights to develop improvements for the travellers journey.
- Feedforward: The instances, when the system provides information pre use guide the travellers. The

## **Appendix I - Description of each topic to assess the findings for the cross-case analysis of the benchmark**

insights in this case are related to the way feedforward manifest itself in the system and how it affects travellers' journeys. It is abstract and noticing it is more difficult than noticing when something goes wrong as when working well it is not evident in the same way that a mistake or problem is.

### **Technological Issues**

Certain issues that travellers experiences were related to failures in technology, however these type of failure is not necessarily related to the way international travellers interact with the system, but could happen to all sorts of users, however during usage of the public transportation system it becomes evident that interaction with validation gates often causes hiccups within the travellers' journeys.

- Gates: The problems related to gates vary but for international travellers often have to do with not finding the pace of validation or that the type of ticket is not accepted, hence the travellers cannot continue their journey seamlessly but must search for a solution.

### **Conclusions**

The study provided related to topics relevant to international travellers experience. The main topics through the travellers journey are: Choice of transportation, Searching Information, Ticket Selection, Purchasing tickets a ticket vending machines and actual usage of the transportation system. These aspects are all elaborated per research location in regards to how they manifest themselves at those locations and are to be found again in the customer journey map, which provides an overview of the findings in chapter 7 and appendix L.

## Appendix J - Complete table of interviewees

INTERNATIONAL TRAVELLERS - USERS OF THE RESPECTIVE PUBLIC TRANSPORTATION SYSTEM								
	Place	Date	Alone/ Pair/ Group	M/F	Approx. Age	Nationality	Tourism/ Business	Video
01.	Schiphol Airport NS T.V.M.	9-Sep-15	Alone	M	20-30	Brasil	Tourism	20150909_121209. mp4
02.	Schiphol Airport NS T.V.M.	9-Sep-15	Pair	M	20-30	Portugal	Tourism - 3 days	20150909_121354. mp4
03.				F	20-30	Belgium		
04.	Schiphol Airport NS T.V.M.	9-Sep-15	Pair	M	50-60	USA	Tourism	20150909_122241. mp4
05.				F	50-60	USA		
06.	Schiphol Airport NS T.V.M.	9-Sep-15	Pair	M	40-50	USA	Tourism	20150909_123143. mp4
07.				F	40-50	USA		
08.	Schiphol Airport NS T.V.M.	9-Sep-15	Group	M	20-30	UK	Tourism	20150909_123254. mp4
09.				F	20-30	UK		
10.				M	20-30	UK		
11.	Schiphol Airport NS T.V.M.	9-Sep-15	Pair	M	30-40	UK	Business	20150909_123946. mp4
12.	Schiphol Airport NS T.V.M.	9-Sep-15	Pair	F	30-40	NL	Coming back from trip	20150909_124842. mp4
13.				F	40-50	NL		
14.	Schiphol Airport NS T.V.M.	9-Sep-15	Pair	M	20-30	NL	Coming back from trip	20150909_125247. mp4
15.				F	20-30	NL		
16.	Schiphol Airport NS T.V.M.	9-Sep-15	Group	M	40-50	Italian	Tourism	20150909_125836. mp4
17.				F	40-50	Italian		
18.				F	10. -20.	Italian		
19.	Schiphol Airport NS T.V.M.	9-Sep-15	Group	F	20-30	Turkey	Tourism	20150909_130416. mp4
20.				M	20-30	Turkey		
21.				M	50-60	Turkey		

## Appendix J - Complete table of interviewees

22.	Schiphol Airport NS T.V.M.	9-Sep-15	Alone	F	10. - 20.	Israel	Tourism - 8 hours transfer time	20150909_131343. mp4
23.	Rotterdam Airport	10-Sep-15	Pair	M	20-30	Slovakia	Tourism - 1 Day Rotterdam 3 Days Amsterdam	20150910_123613. mp4 20150910_124308. mp4
24.				F	20-30	Slovakia		
25.	Rotterdam Airport	10-Sep-15	Alone	F	20-30	China	Tourism	20150910_130042. mp4
26.	Rotterdam Airport	10-Sep-15	Pair	F	30-40	Italy	Tourism	20150910_131330. mp4
27.				M	30-40			
28.	Amsterdam Museumplein	7-Oct-15	Pair	M	20-30	Hungary	Tourism	GOPR0105.MP4
29.				F	20-30	Hungary		
30.	Amsterdam Museumplein	7-Oct-15	Group	F	40-50	Israel	Tourism	GOPR0106.MP4
31.				F	10. - 20.	Israel		
32.				M	10. - 20.	Israel		
33.	Amsterdam Museumplein	7-Oct-15	Group	F	40-50	Israel	Tourism	GOPR0107.MP4
34.				F	10. - 20.	Israel		
35.				M	10. - 20.	Israel		
36.	Amsterdam Museumplein	7-Oct-15	Pair	F	20-30	Canada	Tourism	GOPR0109.MP4
37.				F	20-30	Canada		
38.	Amsterdam Museumplein	7-Oct-15	Group	M	40-50	USA	Tourism	GOPR0110.MP4
39.				F	40-50	USA		
40.				F	0 - 10.	USA		
41.				F	0 - 10.	USA		
42.	Amsterdam Museumplein	7-Oct-15	Group	F	30-40	Switzerland	Tourism	GOPR0111.MP4
43.				F	30-40	Switzerland		
44.				F	0 - 10.	Switzerland		
45.	Amsterdam Museumplein	7-Oct-15	Pair	F	20-30	Serbia	Tourism	GOPR0112.MP4

## Appendix J - Complete table of interviewees

46.				F	20-31	Serbia		
47.	Amsterdam Museumplein	10/7/2015	Pair	F	20-30	Northern Ireland	Tourism	GOPR0113.MP4
48.				M	20-30	Northern Ireland	Tourism	
49.	Amsterdam Westermarkt	7-Oct-15	Pair	F	40-50	Germany		GOPR0114.MP4
50.				F	10. - 20.	Germany		
51.	Rotterdam Museumpark	22-Oct-15	Pair	F	20-30	Italy	Lives in Rotterdam	GOPR0121.MP4
52.				F	60-70	Italy	Tourism	
53.	Schiphol Airport Plaza	29-Oct-15	Group	M	20-30	France	Tourism	GOPR0138.MP4
54.				M	20-30	France		
55.				F	20-30	France		
56.	Schiphol Airport Plaza: Holland Tourism Info Desk	29-Oct-15	Pair	M	20-30	Ireland	Tourism	GOPR0140.MP4
57.				F	20-30	Ireland		
58.	Schiphol Airport Arrivals 2	29-Oct-15	Pair	M	30-40	Turkey		GOPR0141.MP4
59.				F	30-40	Turkey		
60.	Schiphol Airport Car Rental	29-Oct-15	Group: Family	F	30-40	Malta	Tourism	GOPR0143.MP4
61.								
62.								
63.								
64.								
65.								
66.	Schiphol Airport Car Rental	29-Oct-15	Pair	M	50-60	NL - living in USA	Visiting NL	GOPR0144.MP4
67.				F	40-50			
68.	Schiphol Airport Car Rental	29-Oct-15	Alone	M	30-40	NL - living in USA	Visiting NL	GOPR0145.MP4
69.	Schiphol Airport Car Rental	29-Oct-15	Pair	M	50-60	Canada	Visiting Family	GOPR0147.MP4
70.				F	50-60			

## Appendix J - Complete table of interviewees

71.	Schiphol Airport Car Rental	29-Oct-15	Alone	F	30-40	Belgium - lives in Spain	Business	GOPR0148.MP4
72.	Schiphol Airport Car Rental	29-Oct-15	Pair	F	30-40	Rumania	Business	GOPR0149.MP4
73.				M		Rumania		
74.	Amsterdam Stationsplein	29-Oct-15	Group	M	20-30	Norway	Tourism	GOPR0163.MP4
75.				M	20-30			
76.				F	20-30			
77.				F	20-30			
78.	Amsterdam Stationsplein	29-Oct-15	Pair	F	20-30	Taiwan	Tourism	GOPR0164.MP4
79.				F	20-30			
80.	Amsterdam Stationsplein	29-Oct-15	Group	M	40-50	Germany	Tourism	GOPR0165.MP4
81.				F	40-50			
82.				M	10. - 20.			
83.				F	10. - 20.			
84.	Amsterdam Stationsplein	29-Oct-15	Pair	M	30-40	USA	Tourism	GOPR0166.MP4
85.				F	30-40			
86.	Amsterdam Stationsplein	29-Oct-15	Pair	F	40-50	NL	Tourism	GOPR0167.MP4
87.				M	10. - 20.			
88.	Amsterdam Stationsplein	29-Oct-15	Pair	F	20-30	UK	Tourism	GOPR0168.MP4
89.				M	20-30			
90.	Amsterdam Stationsplein	29-Oct-15	Alone	F	20-30	South Korea	Tourism	GOPR0169.MP4
91.	Amsterdam Stationsplein	29-Oct-15	Pair	F	30-40	Ethiopia	Tourism	GOPR0170.MP4
92.				M	30-40			
93.	Rotterdam Airport	07. Dic 15	Alone	F		USA	Business	GOPR0548.MP4
94.	Rotterdam Airport	07. Dic 15	Alone	F		UK	Business	No video
95.	London Heathrow Airport	3-Nov-15	Pair	M	40-50	USA	Tourism	GOPR0181.MP4
96.				F	40-50			



## Appendix J - Complete table of interviewees

97.	London Heathrow Airport	3-Nov-15	Pair	M	60-70	UK - Scotland	Tourism	GOPR0182.MP4
98.				F	60-70			
99.	London Heathrow Airport	3-Nov-15	Pair	M	20-30	Brasil	Tourism	GOPR0186.MP4
100.				F	20-30			
101.	London Victoria Station	3-Nov-15	Group	M	20-30	Spain	Studies	GOPR0199.MP4
102.				M	20-30			
103.				F	20-30			
104.	London Victoria Station	3-Nov-15	Alone	F	20-30	Bulgaria	Tourism	GOPR0199.MP4
105.	London British Museum	4-Nov-15	Alone	F	20-30	Japan	Tourism	GOPR0229.MP4
106.	London British Museum	4-Nov-15	Alone	F	30-40	Portugal	Lives in London since 2 years	GOPR0230.MP4
107.	London British Museum	4-Nov-15	Pair	F	30-40	USA	Tourism	GOPR0231.MP4
108.				M	30-40			
109.	London British Museum	4-Nov-15	Group	F	40-50	Engalnd - Canterbury	Tourism	GOPR0232.MP4
110.				F	10. - 20.			
111.				M	10. - 20.			
112.				M	0 - 10.			
113.	London British Museum	4-Nov-15	Pair	M	30-40	Spain	Lives in Kingsely (close to London)	GOPR0233.MP4
114.								
115.	(London) Windsor Sation	6-Nov-15	Pair	F	20-30	Puerto Rico	Tourism	GOPR0242.MP4
116.								
117.	(London) Windsor Sation	6-Nov-15	Alone	M	20-30	Singapore	Tourism	GOPR0243.MP4
118.	London Heathrow Airport	7-Nov-15	Group	M	30-40	USA	Tourism	GOPR0245.MP4
119.				M	60-70			

## Appendix J - Complete table of interviewees

120.				F	30-40			
121.	London Heathrow Airport	7-Nov-15	Alone	F	50-60	USA	Tourism	GOPR0246.MP4
121.	London Heathrow Airport	7-Nov-15	Pair	M	50-60	Mexico	Tourism	GOPR0247.MP4
122.				M	40-50			
123.	Nong Ping Hong Kong	12-Nov-15	Group	M	30-40	India	Tourism	GOPR0271.MP4
124.				F	30-40			
125.				M	0 - 10.			
126.	Nong Ping Hong Kong	12-Nov-15	Pair	M	40-50	NL	Tourism	GOPR0272.MP4
127.				F	60-70			
128.	Nong Ping Hong Kong	12-Nov-15	Pair	M	10. - 20.	Poland	Tourism	GOPR0274.MP4
129.				M	10. - 20.	Poland		
128.	Nong Ping Hong Kong	12-Nov-15	Pair	M	30-40	Sweden	Tourism	GOPR0277.MP4
129.				M	30-40	Poland		
130.	Nong Ping Hong Kong	12-Nov-15	Pair	M	60-70	Scotland	Tourism	GOPR0278.MP4
131.				F	60-70	Scotland		
132.	Nong Ping Hong Kong	12-Nov-15	Group	M	20-30	Italy	Tourism	GOPR0279.MP4
133.				F	20-30			
134.				M	20-30			
128.	Nong Ping Hong Kong	12-Nov-15	Pair	M	30-40	Poland	Tourism	GOPR0281.MP4
129.				M	30-40	Poland		
128.	Nong Ping Hong Kong	12-Nov-15	Alone	F	30-40	UK - Wales	Tourism - visiting friends	GOPR0282.MP4
129.	Hong Kong Station	12-Nov-15	Alone	F	30-40	Italy	Business & Tourism	GOPR0283.MP4
130.	Hong Kong Station	12-Nov-15	Alone	M	20-30	Norway	Tourism - 2 hours transfer	GOPR0287.MP4
131.	Hong Kong Station	12-Nov-15	Pair	M	50-60	Australia	Tourism	GOPR0288.MP4

## Appendix J - Complete table of interviewees

132.				F	50-60	Australia		
133.	Hong Kong Airport	13-Nov-15	Pair	M	40-50	South Africa	Tourism	GOPR0292.MP4
134.		13-Nov-15		F	40-50	South Africa		
135.	Hong Kong Airport	13-Nov-15	Alone	F	30-40	UK - England	Business - lives in HK	GOPR0294.MP4
136.	Hong Kong Airport	13-Nov-15	Alone	F	30-40	Norway	Business	GOPR0298.MP4
136.	Hong Kong Airport	13-Nov-15	Pair	F	50-60	Canada	Tourism	GOPR0299.MP4
137.				M	50-60			
138.	Hong Kong Airport	13-Nov-15	Pair	M	40-50	Australia	Business	GOPR0300.MP4
139.				M	40-50			
140.	Hong Kong Victoria Peak	14-Nov-15	Pair	M	30-40	UK	Tourism	GOPR0320.MP4
141.				M	60-70			
142.	Hong Kong Victoria Peak	14-Nov-15	Pair	M	30-40	UK - England	Tourism	GOPR0321.MP4
143.				M	60-70			
144.	Hong Kong Victoria Peak	14-Nov-15	Alone	F	30-40	Ukraine	Business	GOPR0322.MP4
145.	Hong Kong Victoria Peak	14-Nov-15	Pair	M	20-30	USA - living in HK for 6 months	Tourism	GOPR0323.MP4
146.				F	20-30			
147.	Hong Kong Victoria Peak	14-Nov-15	Pair	M	10. - 20.	Germany	Tourism	GOPR0324.MP4
148.				M	10. - 20.			
149.	Hong Kong Victoria Peak	14-Nov-15	Alone	F	20-30	Germany	Lives in HK for 3 months	GOPR0325.MP4
150.	Hong Kong Victoria Peak	14-Nov-15	Pair	F	30-40	Australia	Tourism	GOPR0326.MP4
151.				M	30-40			
152.	Hong Kong Victoria Peak	14-Nov-15	Pair	M	40-50	USA	Tourism	GOPR0327.MP4
153.				M	40-50			

## Appendix J - Complete table of interviewees

154.	Hong Kong Victoria Peak	14-Nov-15	Alone	M	30-40	USA	Business & Tourism	GOPRO328.MP4
152.	Hong Kong Victoria Peak	14-Nov-15	Pair	F	20-30	Austria	Tourism	GOPRO329.MP4
153.				F	20-30			
154.	Little Mermaid Copenhagen	24-Nov-15	Pair	M	30-40	Italy - London	Tourism	GOPRO367.MP4
155.				F	30-40			
156.	Little Mermaid Copenhagen	24-Nov-15	Pair	F	20-30	USA	Tourism	GOPRO368.MP4
157.				F	20-30			
158.	Little Mermaid Copenhagen	24-Nov-15	Pair	M	20-30	Germany	Tourism	GOPRO369.MP4
159.				F	20-31			
160.	Little Mermaid Copenhagen	24-Nov-15	Pair	M	40-50	Russia	Tourism	GOPRO370.MP4
161.				F	40-50			
162.	Little Mermaid Copenhagen	24-Nov-15	Pair	M	10. - 20.	Estonia	Tourism	GOPRO371.MP4
163.	Little Mermaid Copenhagen	24-Nov-15	Pair	M	30-40	Germany	Tourism	GOPRO372.MP4
164.				F	30-40	France		
165.	Little Mermaid Copenhagen	27-Nov-15	Group	M	40-50	USA	Tourism	GOPRO390.MP4
<b>SERVICE PERSONNEL OF THE RESPECTIVE PUBLIC TRANSPORTATION SYSTEM</b>								
	Place	Date	Alone/ Pair/ Group	M/F	Approx. Age	Company	Video	
01.	Rotterdam Airport	10. Sep 15	Info. Student Pair	F	20-30	RET	20150910_122308.mp4 20150910_122608.mp4 20150910_123035.mp4	
02.				F	20-30			
03.	Rotterdam Airport	10. Sep 15	Alone	F	30-40	RET	No Video	
04.	Schiphol Airport	07. Okt 15	Alone	M	30-40	NS	GOPRO046.MP4	
05.	Schiphol Airport	07. Okt 15	Alone	M	20-30	Amsterdam Airport/ Connexion	GOPRO047.MP4	
06.	Rotterdam Central VVV	22. Okt 15	Alone	M	30-40	VVV	No Video	

## Appendix J - Complete table of interviewees

07.	Rotterdam Central T.V.M.s	22. Okt 15	Alone	M	40-50	NS	No Video
08.	Amsterdam Zuid	23. Okt 15	Alone	M	20-30	NS	No Video
09.	Amsterdam Zuid	23. Okt 15	Alone	F	50-60	GVB	No Video
10.	Amsterdam Stationsplein	09. Dec. 15	Pair	F	30-40	GVB	GOPR0552.MP4 GOPR0553.mp4 GOPR0554.mp4 GOPR0555.mp4
11.				F	40-50	GVB	
12.	GVB Ticket Office Stationsplein	09. Dec. 15	Alone	M	30-40	GVB	No Video
13.	Westcord Fashion Hotel, Amsterdam	11. Dec. 15	Group ca.5	M/F			GOPR0604.MP4 - GOPR0615.MP4
14.	London Heathrow T1,2,3	03. Nov 15	Alone	M	30-40	TFL	No Video



## Appendix K - Personas: Journey Description



### SPONTANEOUS TRAVELLER



**SAM, 28**

**Computer Scientist  
Australia  
Single**

Travel Purpose: **Interchange flight/tourism**

Type of trip: **Part of a longer trip**

Length of stay: **8 hours**

Number of companions: **0, travels alone**



## PERSONA A

**I want to visit the city centre, grab something to eat and head back to catch my flight.**

**I just need a ticket to get to the city and back as quickly as possible.**

## Use Context



Home

Sam booked a flight with a long interchange, which he sees as an opportunity to see the city. He uses online sources to inform himself how is the best way to do this. Sam is a bit overwhelmed with the amount of sources, but finally decides the train is his best option. As he only has a few hours to go to the city he searches for the most efficient way to go from Schiphol airport to the centre and back. He realizes that going by train with a return ticket is the most convenient option to go from the airport to the city centre.

Dutch  
Airport

At the airport Sam goes to the ticket vending machine and purchases the return ticket he had planned to purchase. He needs a while to figure out from which platform the train to Amsterdam goes, however is able to find the right platform by reading the information on the screens. He sees that some people hold their card against the validator. He is insecure whether he should validate the paper ticket and goes to the service booth and requests this information and double checks that he selected the right platform. He then validates his ticket and goes to the platform.



Train

In the train he reads the screen to know how many stops there will be to the city centre.

Big  
Station

At the central station he is reminded by other people in front of him that he must check out, as the service personnel explained. After he looks around and finds signs describing the way to the city centre.



## SPONTANEOUS TRAVELLER



**JONAS, 22**

**Student**  
**Germany**  
**Single**

Travel Purpose: **Tourism**

Type of trip: **Only trip**

Length of stay: **3 days**

Number of companions: **1, travels with friend**

**PERSONA B**

**We don't really have a plan, we just want to experience fun things.**

**I'm not even sure if we need public transportation... if we do, then we will buy the ticket at that moment.**

**Use Context   Customer Journey Travel Description**

At home Jonas and his friend decide to make a trip, search online for a few days and book it. From friends who have been at that destination before, they get tips on fun things to do.



Jonas and his friend have been walking a lot and decided to go and see a specific attraction that their friends at home recommended, which according to their phone is not within walking distance. They search for the closest bus stop.



They tell the driver where they want to go to and with not much explanation he offers them a ticket that they purchase at the moment. At a certain stop the driver reminds them they must switch to a tramline.



They don't exactly know which is the correct tram and cannot find signs that would quickly inform them. When they do find signage they realize the tram they need is at the other side of the street and miss the tram because of red lights.



They travel with the tram to the intended destination.



On the way back they realized they could have purchased a return ticket, which would have been a little bit cheaper, however they are not very bothered by it, but blame the bus driver for not telling them.



## EFFICIENT TRAVELLER



**PÉTER, 36**

**Chef  
Hungary  
Married**

Travel Purpose: **Tourism**

Type of trip: **Only trip**

Length of stay: **3 days, weekend trip**

Number of companions: **1, travels with wife**

## PERSONA C

**We would like to get to know the city and see the main attractions.**

**I would like to have a ticket that I can use through the whole stay so that we don't have to worry about buying tickets any more.**

## Use Context Customer Journey Travel Description



Home

At home Péter and his wife book their trip and search for information regarding the sights and activities available in the city.

Dutch  
Airport

At the airport they go to an information desk to ask what the best way to go their hotel is, as it is not very central. They receive the information and decide to go by bus as it means no interchanges and they have some luggage.



Bus

They purchase a single ride ticket to the hotel as they want to get there first to leave their luggage and refresh from their early flight.

Hotel/  
Stay

In the hotel they are informed about transportation possibility at check in. Due to the convenience they purchase their tickets, that are valid for two days - the last day of their stay is not covered by the tickets, but the hotel personnel explains that they will need to purchase different types of ticket to go the airport anyway as the bus company that goes to the airport is a different one. Furthermore the hotel personnel gives them tips concerning their travel journey and that they should avoid the central station and which stations are more accessible for certain activities.



Bus Tram

The travellers follow the personnel's advice and travel without many problems.

Hotel/  
Stay

At the hotel they thank the personnel for the good information as they realized the things that were recommended were really better for their purposes.



## EFFICIENT TRAVELLER



# GEORGE, 66

**Retired Commercial RS MGR**  
**Canada**  
**Married**

Travel Purpose: **Tourism**

Type of trip: **Part of a longer trip (agency)**

Length of stay: **4 days**

Number of companions: **1, with wife (in group)**

**PERSONA D**

**We enjoy seeing nice places, having good food,  
just a nice time.**

**Our trip is arranged by an agency so most tours are  
arranged for, but we might want to go to \*specific location\*  
so we will need tickets to get there and back.**

**Use Context   Customer Journey Travel Description**

Home

At home George's wife books their trip through a travel agency - it is a group tour for which everything is arranged flight, accommodations, meals and tours. The only problem is that a specific location, which they both want to return to together, is not part of the tour and they decide they will take one day off the arranged activities to go there on their own behalf.

Small  
Station

George and his wife decide to inform themselves about the location they want to visit and if possible go there. They explain their situation to the personnel and the personnel recommends to purchase a day ticket and the modality information.



Tram

They travel with the tram but don't realize that their ticket must also be checked out, which causes them problems when they must interchange to another line as the driver asks them to validate their ticket on the validator and are rejected. They explain to the driver that they were not aware and he lets them in.

Big  
Station

At the arrival station they search for the best way to go to their destination but can't directly find it so recur to service personnel who is standing around, who guides them.

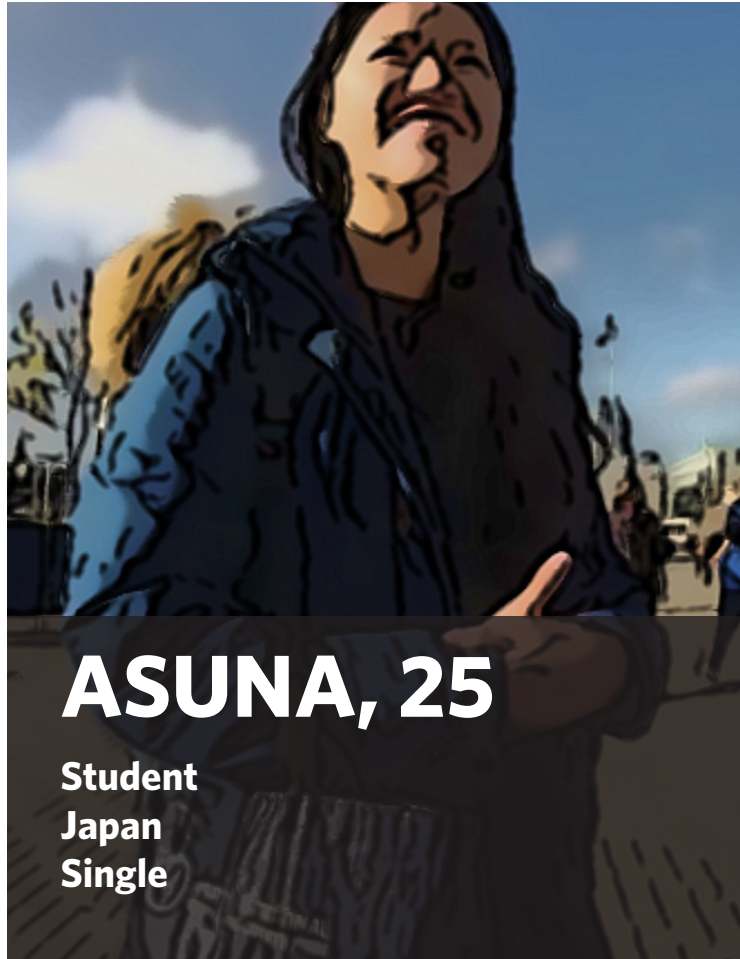
Big  
Station

Directly after the situation they discuss their experience.





## EFFICIENT TRAVELLER



**ASUNA, 25**

**Student**  
**Japan**  
**Single**

Travel Purpose: **Tourism**

Type of trip: **Part of a longer trip**

Length of stay: **2 days**

Number of companions: **2, travels with friends**

## PERSONA E

**I really want to go to \*specific location\* and see the city, but we are only here for two days so...**

**I found a ticket that offers discounts to attractions so I think it is the most convenient.**

### Use Context Customer Journey Travel Description



Home

Asuna informs herself online about the public transportation system as she would like to know the most efficient way to travel due to the short time she and her friends have available. They select the ticket they want to sue and read the information regarding how to use it.



Dutch  
Airport

On arrival they want to go to the service desk and purchase the ticket they had found online, however have some trouble finding the right shop and ask walking service personnel where it is. They then purchase the ticket and must now find the correct platform. Where to find this information is not clear to them, so they decide to again ask service personnel. They are a bit disappointed that getting this ticket took longer than they expected.



Metro

In the city they mainly use the metro, which is straightforward for them throughout the journey.



## PURPOSE TRAVELLER



**MARIE, 43**

**Financial Advisor**  
**France**  
**Married**

Travel Purpose: **Business**

Type of trip: **Only trip**

Length of stay: **12 hours**

Number of companions: **0, travels alone**

**PERSONA F**

**My flight was a bit delayed so I have to get to my meeting as soon as possible.**

**I need a return ticket to get there now and back to the airport later.**

**Use Context    Customer Journey Travel Description**

On arrival at the airport Marie goes to the ticket vending machine and is annoyed by the cue, however the cue at the service desk is even longer. When it is finally her turn she is not sure what option she should select as the ticket names are not clear for her and she only has to go to one of the main stations. When she figures it out she tries to pay with paper money, and realizes she can only pay with coins, so she recurs to pay with the card. The card she uses is not accepted by the ticket vending machine and she is annoyed that she must use another card. The second card works and she can purchase the ticket. Now she is not sure of where to go, but has no time to look for herself therefore asks walking service personnel who guides her to the right platform. She does not check-in - because in the hectic of catching the train she did not even think about it.



The train ride goes smoothly and she reaches her destination.



**SET TRAVELLER**



**GIULIA, 18**

**High School Graduate**  
**Italy**  
**Single**

Travel Purpose: **Tourism**

Type of trip: **Only trip**

Length of stay: **2 days**

Number of companions: **0, visits friend**

## PERSONA G

**I want to see my friend Laura and it is a great opportunity for me to go to \*specific city\*.**

**I don't know what kind of ticket I need, but Laura knows.**

### Use Context Customer Journey Travel Description



Home

At home Ana downloads a travel app where she informs herself a bit about her travel destination.



Bus

In the bus she validates her ticket because her friend told her to. On the way out of the bus she forgets to, but her friend is quick enough to validate the card before the bus leaves, if she would forget then a fee would be charged.



**SET TRAVELLER**



**CATHY, 38**

**Teacher**  
**USA**  
**Married**

Travel Purpose: **Tourism**

Type of trip: **Only trip**

Length of stay: **7 days**

Number of companions: **4, family visits aunt**



## PERSONA H

**We are so happy to visit my sister, their aunty Rachel, and show the kids other cultures.**

**Rachel gave me these cards, so when we need them we will use them. She said we might have to reload them depending on how much money we spend, Gary knows how now.**

### Use Context   Customer Journey Travel Description



Home

At home Kathy reads blogs and in her travel guide about her destination and what kind of activities she and her family can do during their trip.



Hotel/  
Stay

At her sister's house Kathy plans her journey with help of her sister and her travel guide.



Big  
Station

Kathy and her husband look for the right way and have no problems finding it with the signs.

Appendix K - Personas: Journey Description

Customer Journey Legend

Journey steps per persona

- PERSONA A: Sam
- PERSONA B: Jonas
- PERSONA C: Péter
- PERSONA D: Gorge
- PERSONA E: Asuna
- PERSONA F: Marie
- PERSONA G: Ana
- PERSONA H: Cathy

Touchpoint Icons

- (P.T.)Websites & Blogs
- (P.T.) Apps/ Smartphone usage
- Information Screens Screens
- Information Posters
- Signage
- Information Brochures
- Travel guides
- Word of mouth/ media
- T.V.M. (Ticket vending machine)  
A.V.M. (Add value machine)
- Gates/Vadiators
- Service Desks
- Walking Employees
- Drivers/Conductors

Explicit Problems

- Information Overload/ Lack of transparency
- P.T. Operator complexity
- T.V.M.: Only coin payment available
- T.V.M.: Bank/Credit card rejected
- T.V.M.: Unclear ticket names
- Service Personnel
- Signage/ Maps

Further travel related steps

- Searching contextual information
- Searching locational information

## Appendix K - Personas: Journey Description

## Appendix L - Individual analysis of The Netherlands, London, Hong Kong and Denmark

### The Netherlands

Topic	Subtopic	Property	Manifestation (+ quote)
1. Choice of transportation	Selection by convenience factor	Accessibility	<p>Travellers, who did not opt for public transportation, but for renting a car upon arrival at the airport argued their decision with accessibility. In the Netherlands it surfaced that they have to go to more remote places or the countryside hence rent a car as getting there with public transportation is less accessible. Using the car provides a perceived freedom to travellers.</p> <p>“For me yes (in the Netherlands the best option is a car), but I can imagine that for other people public transport is fine if you work close to a station or you live close to a station its fine...”</p> <p>“Yeah (we have multiple destinations) yes, we live in on the country side so if you visit someone in the countryside then there is no public transportation.”</p> <p>“(We chose a car because it gives us) Freedom of movement, so we can go wherever we want to.”</p>
		Comfort	<p>Comfort is related to the perceived wellbeing of the user when using a specific type of transportation, in the Netherlands the usage of the tram in Amsterdam was complemented for its cleanliness. However the using the trains with luggage, usually at the moment of arrival or departure from the city to the airport is uncomfortable for travellers due to the stairs and the lack of space in the trains.</p> <p>“(The tram is) great, easy and very clean.”</p> <p>“Today I actually am going to take a taxi, it is because the place where I need to go is close by the airport so getting a rental car would be more expensive and getting a bus is way to uncomfortable so I am going to get a taxi.”</p> <p>P.E./O. Using the NS trains with luggage is not easy due to the steps to get into the train and inside of the train, furthermore there sometimes is not enough space for the luggage while in the train.</p>
		Distance	<p>When deciding what type of transportation to use travellers often check first the distance walking to judge based on that whether it is worth it to purchase public transportation ticket or to use another means of transport. This situation was observed specially in cities at attractions relatively close to the city centre (of Amsterdam and Rotterdam).</p> <p>P: Around Amsterdam Zuid there are many hotels, so the people who stay around here of course walk.</p> <p>“It’s only 20 minutes (with the tram), walking is 34 (shows her phone).”</p> <p>O: Most people arrive walking from the city centre to the (Museum Boijmans Van Beuningen) even though it is raining. According to Google Maps walking from Rotterdam central takes approximately 16 minutes, while taking public transportation between 10 and 15 minutes.”</p>
		Efficiency	<p>In Schiphol airport travellers renting a car perceive public transportation as less efficient than a using a car, which is the reason for them to not use public transportation. The efficiency of public transportation in The Netherlands was never mentioned by users thought the study. This provides the idea that is does not provide either a negative nor positive impression to the travellers in general.</p> <p>“(We chose a car because it gives us) freedom of movement, so we can go however we want to. Then we also have immured time, so we would like to go to places as fast as possible. Yes (I think public transportation takes longer than taking the car) because you first have to go from where you are staying to the train station, from the train station to where you want to go and then you have to take public transport.”</p> <p>“My parents live in the south of the Netherlands and transportation takes two hours thirty minutes with the train and bus and all that stuff and with the car is only one hour and thirty minutes so it saves a lot of time.”</p>
	Selection based on Experience	Failed attempt to use public transportation	No data is available concerning a failed attempt to use public transportation in The Netherlands.
		Public transportation assumption or bias	<p>Some travellers base their selection for public transpiration and also for tickets on previous experiences, as is the case with people who do not regularly use public transportation in their home countries/cities. They know a certain way of travelling and prefer to use it, like using the car or at least don't know how to interact with public transpiration and therefore discard it. Furthermore assumption in the way the system works might influence the whole perception of the system, as is when people assume an OV-chipkaart only is for residents of the Netherlands, without having factual information of it.</p> <p>“In Canada that is how you get around. We are more familiar I guess and better with driving than using public transit.”</p> <p>“Taxi, we don’t know how to use this (train), we just asked and we preferred to use taxi, cause we are new to Amsterdam. To get train you need to know first where to get a ticket or something and we don’t know. No, we did not try.”</p> <p>“I see it (the OV-chipkaart). Not living in the Netherlands I don’t know if it is the most convenient for me, but I don’t know if it is, like I don’t, there is no information. No (I have not looked for information). I guess that for people abroad they don’t make it easy for you to get this kind of information quickly, because it is cheaper because it is for the residents mainly I guess.”</p>
2. Searching Information	Service Personnel	Type of information requested	Through interviews mainly with service personnel of the Dutch public transportation companies it became evident that they often help travellers with more than just questions regarding their public transportation organisation they work for, but also for other companies, shedding insight on the concept that for international travellers, especially ones unfamiliar with the system and with little or no knowledge on differences between companies, there is rather an understanding of service personnel knowing information regards of all types of matters concerning public transportation. Furthermore service personnel are often the touchpoint for travellers to gain information on other issues such as the location of retail and facilities, such as toilets, or even as tourism advisers. In the Netherlands the service personnel steps in as much as they can when asked, even though in some cases they can only help using their personal experience and kindness and not a trained reply to the request of travellers. Whether or not the information the personnel provide is of good or bad quality it will affect the travellers’ journey and experience.

## Appendix L - Individual analysis of The Netherlands, London, Hong Kong and Denmark

			<p>P: People don't read the rules about the product they buy or bought, so they don't know what they can do with the ticket and ask us.</p> <p>"Sometimes we go to the machines an help the tourists. We are standing over there and they come to us for NS, but we are standing by GVB. If we know it then we tell them where to go from there..."</p> <p>"Then we have to know where the stores are, they ask..."Hema where is Hema" "Hema?" "I want to go to Starbucks."</p> <p>"Is there a pharmacy?" So a lot of questions, different questions. People are getting angry if we don't know a thing from NS you know, they think we have to know if they ask something, but we don't know everything from NS or Connexion or RET."</p> <p>P: Further questions regarding their stay are things like "We are here for a few hours, so what can we do?"</p>
		Way of providing information	<p>In some cases the lack of explanation provided by the service personnel causes travellers to have a negative experience with public transportation, as they purchase a ticket or use the system in the wrong way, as they don't full understand what they are doing. The example of a more clear explanation of public transportation system is provided by hotel personnel, as they more carefully explain the workings of the system. It must be notices however they only one type of ticket is sold and explained dot travellers at the hotel and thus the complexity of the system is not communicated or at least reduced.</p> <p>"Nothing has been explained about what ticket you need for which area and we have travelled a couple of weeks, we have been in lots of different cities and everyone always explains "what you need the ticket for" "where are you going" and they can tell which are the better ones. Yesterday we just got given a ticket and we couldn't even use it.</p> <p>We have another question. We were at the machine and actually we tried to...what kind of options should we chose? There was two, like buy Anonymous</p> <p>RET student helper: Yeah that's the OV-chipkaart and you can recharge that one, so every time you take the bus. I don't know how long will you stay here?</p> <p>M: One day.</p> <p>RET student helper: No, no, you don't have to buy that. You can buy a one-day ticket.</p> <p>M: So the second option is disposable?</p> <p>RET student helper: Yes. I will walk with you.</p> <p>S1: "Here is some information about the public transportation. I'll give you a map and explain to you about it. The hotel is here. The centre of Amsterdam is over here. If you would like to use the public transport use the trams, number 1 or 17 will take you to the city in about 12 minutes. If you buy day passes, don't forget with you passes you check in and check out. Always check in, always check out. Always swipe the card when you go into the tram and always swipe the card when you go out, because if you do not check out you cannot check in anymore. Anything is particular you would like to see? If you have any questions pleas let us know."</p>
		Location of assistance	<p>For the service personnel providing information can be facilitated by the location at which they provide information in regards of orientation, but also it facilitates the travellers to find solution for their questions in a more relevant moment, often the moment of use. In the Netherlands there are many employees walking inside and in some cases outside of the station to help travellers.</p> <p>P: Having the ticket office in the station is harder than outside because I cannot point out directions and show them the way except for the map, but its not the same.</p> <p>"I think here they ask more (on Stationsplein than in the ticket office). This is a good thing you know, because before it wasn't there that we are standing here so it began asking for a few people, a few colleagues ... It was a little group and now it's a big group."</p>
		User assumption "asking the service personnel is best"	<p>In The Netherlands it was observed that several travellers use the booths in the tram to inform themselves about ticket options, finding the right tramline or in general way finding although at the tram stops information is provided. Some travellers explicitly suggested that they prefer to talk to someone than to figure out the information themselves. The fact that the possibility to do so in most of Amsterdam trams provides a pleasant experience for travellers. In other transportation modalities like buses the drivers also provide information, however must concentrate with actually driving changing the value of the service provided.</p> <p>"I think we will buy the ticket on the tram, maybe they can recommend us the cheapest way. We only need one right? In one direction. I think it is if you want to purchase, like if you want to reload your card then it is good. But since we don't want to spend too much money on it maybe the conductor can recommend us the cheapest solution for the one (ticket)."</p>
	Public transportation signage	Unclear signage	<p>In the Dutch public transportation system it often comes to the situation that users do not understanding what the signage is trying to communicate in terms of transportation company.</p> <p>"People don't see the difference between NS and GVB, they don't see the different colours and even if you put signs on the floor people walk looking at their smartphone and would miss it."</p>
		Signage style	No data is available concerning the style of the signage in The Netherlands.
		Signage location	<p>Depending on the context the location of the signage is an important factor. At Schiphol Plaza there is a lot of visual information and depending from which arrival the travellers come out it is easier or harder to orientate within the airport making the location of signage very important during their journey. Another striking observation is that the information posters at Stationsplein in Amsterdam or the map at the VVV in Rotterdam Central station are placed in a</p>

## Appendix L - Individual analysis of The Netherlands, London, Hong Kong and Denmark

			<p>way that traveller approach and successfully use them. At the Rotterdam-The Hague Airport the information about public transportation is on front of the ticket vending machines. This causes users, who are trying to purchase a ticket at the ticket vending machine to stand with eh back to the information, making them not read it, or not letting them read it depending on the amount of people standing in front of it. Hence it is very relevant to asses where the signage is located for the travellers journey flow to be as seamless as possible.</p> <p>O. When arriving at Schiphol Plaza it is not necessarily clear where the exit is, nor where to find public transportation or other services, as there are many shops and restaurants.</p>
		Amount of information	<p>In some cases signage is available, however perceived as not there by the users. This situation happened some times during the research in Schiphol Plaza and might be cause due to the information overload caused by different sources. Depending on what the travellers needs they might or might not find it at a relevant moment during their journey.</p> <p>M1: It is a big airport but you are... the pancarts M2: The banners, there are no maps M1: To explain the exit of the airport...to go to Amsterdam central it is difficult to find the way that we go. Yeah (we know we want to take the train). In the book (we found the information). And then it is not right which train to take.</p>
		Spatial orientation	<p>Google Maps &amp; smartphone usage</p> <p>During the field research in The Netherlands it became evident that Google Maps is a tool relevant to the experience of international travellers as it is a tool used by many travellers in order to find their destinations and the way to their destinations which in many cases is public transportation. It was observed that Google Maps is not only a help for travellers who search for the options and information on getting from A to B, but also an easy and practical way for the service employees to help travellers, who ask for information about getting to a specific location.</p> <p>"It is easy to sue the tram and we can use Google maps and it helps."</p> <p>O. To find the places that the travellers ask for the GVB Employee at the GVB ticket office at Amsterdam Stationsplein uses Google Maps to find and explain bet way.</p>
	Language problems	Public transportation maps	<p>In the Netherlands the NS-line map at Schiphol Airport caused confusion to travellers, who by assumption thought that the lines shown are metro lines and not train lines. The user tries to find the right colored line on the poster that will take him to Amsterdam Central but is not completely sure which one it is form the information provided on the poster. This situation is related to lack of contextual knowledge and assumption made bye the traveller. Simplifying the train system into visual with coloured lines had the impact on their public transportation experience of this traveller of searching for something that is not there.</p> <p>"So now, I will check here (goes back to NS map poster). Amsterdam Central is, this is here, this is...so we have to look at the timetable. So we should follow the red or the blue line to go to here (points at Amsterdam Central on the NS map poster) and for red and blue?"</p> <p>....</p> <p>But we are looking for metro not..., this is for train (screen at platform). Yes we are looking for metro, its downstairs? F: Is it for train (and looks at her ticket)? M: OK? So you don't have metro here in Amsterdam. In the city? So from here you should go by train? From airport there is no metro, which goes to the centre of the city? OK."</p>
		Mental state	No data is available concerning the mental state of travellers at specific travel instances in The Netherlands.
		Confusion between modality types	<p>An interesting aspect of translation is the side effect of losing content, and service personnel in The Netherlands in different interviews provided the information that communicating about transportation modalities has a relevant impact on the information travellers request and they provide. Confusing the transportation modalities due to the words used seems as a stupid mistake than however might influence the traveller journey and whole experience. It seems though as if the personnel is used to this situation and handles it appropriately.</p> <p>" They tell us "Yes we have to go by train" for us it's a train inside and they mean this one (the tram) or the metro. Yes. So we have to ask them: which number? Where are you going? Otherwise you send them to a wrong place. I have to ask them which number otherwise he said "Metro" "Metro 13" It doesn't exist. It is a tram."</p>
3. Ticket selection	Reason	English insufficient	<p>Across The Netherlands information provided is not necessarily done in English, except for specific touchpoints, like airports really related to international travelers. If international travellers, who do not speak Dutch, however travel further than the "typical" international locations their experience might not be as good as it could have due to lack in communication and understanding. However it emerged that in some cases not only English is necessary but further languages to stop problems of happening due to communicational issues.</p> <p>"More information in English and in Spanish should be provided for people to know what to do or what is happening: often after the announcements in the station people come and ask "What did they say?", because the announcements only are in Dutch. By the moment I can explain to them what happened it might be to late because the train just left."</p>
		Length of stay	<p>The length of stay as an important property in ticket selection manifests itself in The Netherlands in several ways, however two striking insights regarding the length are the following. Some travellers who purchase the "Day tickets" have conflicts with the time of first use, as the hours start running from the first hour of use and are not date related. In some cases travellers purchase a more expensive tickets with more hours to be sure that they can still use it on the last day even though they are not sure when they purchase it if they will need it and there a travellers who purchase a type of ticket and find them selves with the need of purchasing separate tickets as soon as their day(s) ticket runs out, both inconvenient situations within the travellers experience with public transportation.</p> <p>Furthermore often travellers know at least vaguely about the option of purchasing the Anonymous OV-chipkaart but believe the length of the stay is not enough for them to consider the chipkaart. Often this also is the option of service personnel, which almost never suggests it.</p> <p>"We came on Sunday and we are leaving today, so we purchased the 72 hours ticket, but the timing was bad and it is already expired so now we have to buy some more tickets."</p> <p>"I've seen people using it (The OV-chipkaart), it's like a smart card with tapping in and out. Yeah, I've seen it, but I</p>

## Appendix L - Individual analysis of The Netherlands, London, Hong Kong and Denmark

			<p>didn't know how to get one or whether it would be worth it and we are just here for a few days."</p>
		Price	<p>In The Netherlands personnel stops travellers from purchasing the OV-chipkaart because it is expensive and suggest other types of tickets depending on the length and nature of their stay.</p> <p>In The Netherlands when purchasing a paper ticket one Euro extra must be paid compared to people who use an OV-chipkaart. In one case this caused the traveller a negative sentiment, as she believed that due to the fact that she is paying the extra fee she would be able to recharge the paper ticket. The experience with public transportation is altered as for the traveller this one Euro meant that the information regarding this one Euro was not clear at the moment of purchase and is perceived as unfair at a further moment of use – in a sense the traveller was forced to accept something she did not understand initially.</p> <p>"It is also an investment, you pay 7,50 for a card and if you want to get your money back when you leave the country it is minus 2,50. SO you invest 10 Euros and if you are here for three days that's not...if it is for a weekend or if they just make a few trips I don't recommend the OV-chipkaart. Very often it is worth to buy two day or three day travel cards."</p> <p>"Why we cannot use those cards back? Because we paid one Euro for the cards?...It is stupid, because you pay one Euro for it more, you cannot reuse it. Why?!"</p>
		Extra benefits	<p>The extra benefit manifest themselves mainly in the Amsterdam card in The Netherlands. The travellers, who purchase the Amsterdam card in general are satisfied with their purchase as they believe it very convenient through their journey to have both attractions and transportation in one card.</p> <p>"It (Amsterdam card) is (convenient) because it combines attractions, entrance to the museum and other places we would like to see plus public transportation."</p> <p>"Yeah, we googled transportation and then we also googled like we were looking for at touristic attractions and then we came across the Amsterdam card and it had all of them included so we were like we can just buy that and we are sorted for the weekend."</p>
		Other influencing selection factors	<p>"Non-selection": Visiting friends/family</p> <p>In The Netherlands when international travellers are visiting their relatives they often received Anonymous OV-chipkaarts. The benefit of this is that they already are provided with the ticket and the information of use. However it might come to difficulties in the usage if the travellers are faced with a touchpoint that they are not familiar with, for example with reloading the ticket by themselves. This travellers had no experiences with the ticket vending machines at the beginning of their trip, but somewhere in-between breaking the flow of their travels.</p> <p>"I have a few spare cards for family when they come so they can know move around the city when their own card – the one not personal you know, the one you can charge all the time. That is why she was checking because she put money every time she comes here."</p> <p>"We are staying with a relative, who got us cards that were loaded. We have been using the tram. ... it took us a while. The first options only appeared to offer one day, two day, three day passes and it took a couple of screens before we could figure out how to add value."</p>
		Selection through service personnel advice	<p>In The Netherlands the situations observed happened both with public transportation with service personnel and also with the service personnel at the hotel of the traveller. The main difference observed here is that the hotel personnel has more information on the recurring location the travellers need to go to, namely the hotel and can base their advice on this one point compared to the public transportation service personnel has a much wider range of locations to consider. In a specific case the travellers experience with public was impacted very negatively in regards to the transportation tickets they bought at the desk showing that this matter, might not happen frequently but when it does happen it can change the travellers experience completely.</p> <p>"A: As soon as we got to Amsterdam we went to the travel desk to get a ticket. We got a is it a GVB ticket? It turns out that isn't the ticket we needed. We needed a regional ticket, because where we are staying is just outside of the city, so GVB doesn't cover it. We have been having problem inside trying to get money back and getting a refund of things.</p> <p>B: Nothing has been explained about what ticket you need for which area and we have travelled a couple of weeks, we have been in lots of different cities and everyone always explains "what you need the ticket for" "where are you going" and they can tell which are the better ones. Yesterday we just got given a ticket and we couldn't even use it.</p> <p>...</p> <p>A: We just had to buy a single ticket on the bus (to get to the hotel). Now we bought a day pass a regional card from the hotel itself."</p>
		Operator complexity/compatibility of tickets:	<p>In The Netherlands there are multiple public transportation companies and unless the travellers use an OV-chipkaart often they cannot use other transportation operators with the tickets they purchase, often this is the case with paper tickets. For international travellers the complexity of knowing which ticket to purchase for which operator and where the tickets are valid is challenging. There are several hybrid tickets that operate for two or more companies, however there is no clear overview from the users perspective. The personnel of a specific public transportation company often have to explain this situation to travellers or must explain information regarding tickets of another public transportation companies, not their employer, to the travellers. This situation can cause major discomfort for travellers within their public transportation experience.</p> <p>P. The system was easier when the tickets, like the daily tickets, were valid also in Connexxion and other companies. Now the tickets are only valid in GVB and people need two different types of tickets if their hotel is not in Amsterdam.</p> <p>"Is better (if we would give information/tickets about every company), because sometimes you can get to one point with GVB and then you have to switch on another company and then you have to pay again. If there is a combination then it is cheaper for everyone."</p>
		Moment/ Location of Journey	<p>In The Netherlands the Airports are one of the most important locations for ticket purchase. In Schiphol airport it became evident that the Connexxion ticket desk is not as central while the NS ticket desk, which forms a prominent part of Schiphol Plaza, however the red information bus on the bus platform functions well and sells tickets to the tourists who decide to ride by bus. The Holland Tourist Information shop, at which the Amsterdam card can be</p>



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			<p>purchased and picked up is not central and therefore not necessarily available for tourists who did not inform themselves previously. Further hot sports are the Central stations (including Stationsplein in Amsterdam). Travellers who plan their visit less usually purchase in a more spontaneous matter wherever they are which could be on vehicles or stations close to the attractions/activities they are carrying out. Some information was gathered regarding the purchase of tickets in hotels, which seems to work well for several travellers, who first just purchase tickets from the airport to their hotel but still need to sort out the rest of the trip. With more insight on what kind of travellers purchase what kind of tickets at which stage of the trip and can provide information on touchpoints, like the correct amount and accessibility.</p> <p>"We came though Eindhoven, we had a transfer bus already purchased with the airplane ticket. In front of the central station I think in the central building of Amsterdam (we bought the 72 hour Amsterdam ticket)."</p> <p>"We got to Schiphol. Then we used the bus 197. There is a ticket counter right in the station, it was very easy."</p>
		Selection based on previous knowledge	<p>Throughout the field research in The Netherlands only one group of travellers was found, who had informed themselves about the OV-chipkaart and purchased one. According to service personnel in The Netherlands usually the travellers with an Asian background are the ones who are informed, at least to a certain extent about the tickets they should purchase - in specific the electronic cards -- and compared these to travellers of other nationalities, who mostly inform them selves on the spot at the moment of arrival. This might have many reasons regarding cultural aspects, but also be related to previous experiences of the travellers. The analysis of the ticket selection regarding having (no) previous knowledge can be found in the Cross-Case Analysis section.</p>
		Selection without previous knowledge	<p>P. I think before people come to the Netherlands they don't know anything about the public transport here.</p> <p>"No, we did not (inform ourselves about public transportation before coming). My wife, she made the reservation and then we just landed and we are trying to find it."</p> <p>"A: Yes, first time coming here. I arrived to the airport and then I took a train to here. (I bought an) OV-card, yes because I will stay here for 5 days and then I bought the OV-card and a top of 50 Euros in it so I can just use it to go somewhere. (I found it) on the internet.</p> <p>B: Yeah (I also bought an OV-card) I already bought it before. I bought it from the counter. No (they didn't explain how it works) but I know how it works haha, because I did the research on the internet so I know if I get the card I know how to use it. Yeah (we have something similar at home), in different cities we have different types but you can use the similar card to get the metro, bus or train as well."</p>
			<p>When using the ticket vending machines in The Netherlands it became apparent that the travellers often did not clearly understand the terminology used for ticket names or did not clearly understand the information provided at the machines, providing insight on the aspects of the information and communication that could be further analysed and improved to improve the travellers experience with the usage of the machines.</p> <p>"People confuse the meaning of the "2x 1 hour ticket", they think it is for two people for one hour."</p> <p>"A: We don't know what's the difference between purchase Anonymous or purchase Disposable OV-chipkaart. B: Because I think we are Anonymous? We don't know what is chipkaart."</p> <p>"But we are looking for metro not..., this is for train (screen at platform). Yes we are looking for metro, its downstairs? F: Is it for train (and looks at her ticket)? M: OK? So you don't have metro here in Amsterdam. In the city? So from here you should go by train? From airport there is no metro, which goes to the centre of the city?"</p> <p>"I don't know what the differences between any of these are. Yes, like "Purchase Anonymous Chipcard" or "Purchase Disposable"...I don't know the difference. I don't know. Maybe it s just like a different, like a British version."</p>
TOPIC 4: Ticket purchase at ticket vending machine	TVM Interface	Ticket names/information or benefits not clear	<p>At the ticket vending machines in the Netherlands some users try to do something that does not result in what they expected, are not sure of how to interact with the machine or simply use the machine in a way that is not intended, giving insight on the aspects of the interface that clearly communicate what the users requires to interact properly with the machine and the aspects that do not do so. Different moments during the usage of the machine result in difficulties for the users. These moments can provide valuable insight for opportunities to improve the interfaces of the ticket vending machines.</p> <p>O. They type "Lelylaan" and cannot find the station they are looking for which is called "Amsterdam Lelylaan". It takes them a while to figure out that "Lelylaan" is one of the stations included in the list of "Amsterdam".</p> <p>The bank card payment is not being accepted and the woman presses screen when it says "Follow the instructions on the paypad". She needs a while to realize that she has to cancel on the paypad and not on the screen. "It doesn't work (while pressing t.v.m. screen). I want to cancel. (Now she presses cancel on the paypad)."</p> <p>O. While on "Product Finder" she tries to press the option explained (Hyperlink) however whenever she presses she is back on the ticket selection screen with all the options.</p>
	Payment method	Bank/credit card declined	<p>In The Netherlands when people were paying for their public transportation tickets at the ticket vending machines very frequently their bankcards (sometimes credit cards) were not accepted by the ticket vending machine. In some cases the users corrected the selected icon to fix the error and in other cases the travellers did not know the pin of their credit card, which they are used to only swipe in their home countries. This situation can be the trigger of a negative perception of public transportation system, at least a negative experience for travellers at an important phase of their travel journey.</p> <p>When paying for single tickets to Amsterdam: "A: It (the card) works?"</p>

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			<p>B: Maybe not this one.</p> <p>A: "Follow the instructions on the paypal" ....wait!</p> <p>B: No, but it says remove the card. Unable card! (after trying to pay with a second card)Two (cards)... And that is as much as I have.</p> <p>A: I'll pay. (uses cash)"</p>
		In cash, only coin payment available	<p>In the Netherlands at the ticket vending machines several cases were observed in which travellers realized that they cannot pay with paper money but only with coins when they already had selected payment in coins option and have the bills in their hands. A consequence of this is that they search for coins and during the time they need to look for or gather the right amount of coins the screen explains that they have taken too long and goes back to another screen. In some cases the travellers were still busy searching during the amount of time the screen explains that they have taken too long and they don't even receive the message but face a ticket vending machine screen that is unexpected. This situation can be the trigger of a negative perception of public transportation system, at least a negative experience for travellers at an important phase of their travel journey.</p> <p>"Wait if I have this (shows 5 Euro bill) I cant? It's not a coin. Oh no. Cause I have only this and then little coins. (She goes back to her bag/wallet and looks for something. In the mean time the t.v.m. screen goes back to the start screen.)"</p> <p>O. The woman selects her ticket and payment in coins. She looks in her wallet and wants to use a 5 Euro bill to pay. She looks for the place to insert it and realizes she can only pay in coins. She starts looking in her bag/wallet. While she is looking the t.v.m screen shows the sign saying "You have waited too long before inserting your coins" and goes back to the ticket selection screen.</p> <p>"Coins". (Presses coins option on the payment interface of the t.v.m) Can I use this (Shows 5 Euro paper money)?"</p>
		OV-chipkaart/ bankcard reader location	<p>In the Netherlands at the ticket vending machines some cases were observed in which travellers struggled to find the correct place to insert the card and when they figured out where it should go did not know how to insert it. The OV-chipkaart icon is not clear; the travellers only recognize "a card" icon and elate it to the payment card. This situation can be the trigger for a negative experience for travellers at an important phase of their travel journey, however seemed as something that could be solved by the travellers themselves after a few tries.</p> <p>"We didn't know that this (points at OV-chipkaart icon)...we put it down there where the credit cards go...we didn't know that that is the place."</p> <p>"It (ticket-vending machine) is easy and simple, but this is new for me (points at bank card reader) putting my card is challenging, but except that all is OK."</p> <p>"It cancelled again. (Woman inserts the card again and can continue the transaction). Finally it works. It should have been easier. We are well-educated people and now we are spending time to understand how this works."</p>
			<p>Certain issues that travellers experienced in The Netherlands were related to failures in technology of the ticket vending machines, however these type of failure is note necessarily related to the way international travellers interact with the system, but could happen to anyone, also domestic travellers. They have an influence on all travellers experience in regards to public transportation and provide the insight on improvement opportunities.</p> <p>"In the Leidseplein with the machine. (It was) not so good, because we paid for three tickets and we only got two and we have the receipt, we have the receipt with us, so if someone asks we can show them that we bought three tickets...yeah three days, we bought it for three days."</p> <p>"When she presses sometimes she has to press a few times as the touchscreen doesn't react."</p> <p>"The Dutch woman wants to buy 2 separate tickets and sects the Dutch language option. When selecting the letters for her destination the machine selects the wrong letter twice. She presses "treug" (back) however the machine jumps a few screens. She gets back to the starting point and buys the intended tickets."</p>
Public transportation usage	First time use	Lack of usage information	<p>According to the NS service personnel the gates are a positive change as people have tickets when they go in the train and they don't forget to check in and out. The gates provide information to the travellers about validation as it is inevitable to enter the system without validating at the gates. The insight in this case is related to the way feed forward manifest itself in the system and how it affects travellers' journeys, which in this case specifically is preventing them from making mistakes naturally providing a more seamless journey. In one of the examples where the traveller had a lack of usage information on the check-in and check-out system a tram left in front of him, however the first time use mistake provided him with the information he needed and he adapted as he learnt from the mistake. In an ideal situation for a seamless experience these kind of situation would not happen at all.</p> <p>"The gates are a positive change, people have tickets when they go in the train and they don't forget to check in and out."</p> <p>"Well it was pretty convenient, well at the first moment we had some difficulty with the tram, I mean in our country you can enter any door; and here this whole system of check-in check-out was unusual, but after the tram that left in front of us then on the second tram we had no difficulties - it was pretty easy. Since we didn't know how it works and no one explained us we had to figure it out but it wasn't too difficult."</p>
	Technological issue	Gates	
			<p>P. The gates are a problem when people have a QR code, I have to check their ticket and usually it is valid and then I let them in.</p>

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### London

Topic	Subtopic	Property	Manifestation (+ quote)
1. Choice of transportation	Selection by convenience factor	Accessibility	In London when travellers did refer to the accessibility it was related to the fact that the whole Greater London area can be reached with the Transport for London system.  “(The transportation system) oh its good, because here you can almost go everywhere with the tube or with a bus.”
		Comfort	No data is available concerning comfort of transportation in London.
		Distance	In London it was observed, however less often than in the other countries, that some travellers prefer to walk in the city and must only use public transportation from Heathrow airport to the city centre, as that distance is not considered “walkable”.  “I think that we can walk (in the city). (The ticket is) only for going to our hotel.
		Efficiency	In London the use of the tube system provides a feeling of efficiency to the travellers as the tube trains are constantly running. However above ground traffic affects the efficiency of buses and might be perceived negatively by some travellers, who are used to more efficient services in their home country or not used to traffic.  “(The transportation system) I think is absolutely great. We have not have to wait for more than four minutes for the underground train, we haven’t used the buses yet...”  “Traffic is busy so time waste there or so. Japan is on time, always on time so its different from here.”
	Selection based on Experience	Failed attempt to use public transportation	No data is available concerning a failed attempt to use public transportation in London.
		Public transportation assumption or bias	No data is available concerning a public transportation assumption or bias in London.
2. Searching Information	Service Personnel	Type of information requested	In London it became evident, that although the amount of service personnel is perceived as very large, that not all personnel is able to help with specific questions regarding public transportation. The service personnel seems to know the basics about the system, which helps out the most travellers however with special circumstances seem a bit of a challenge. The service personnel seems to provide “quick fixes” for the moment being to avoid a bigger problem from happening, especially at gate lines. Further information concerning what kinds of information travellers request from the service personnel is not available.  P: When tourists arrive here they do not know anything, they ask where they can find information (maps) or where to buy the tickets or what they need to buy – so we ask them for the duration of their travels and then we tell them what they should buy.  P.E. The service personnel did not really know what I should do in my circumstance and I felt like one person always sent me to the next person instead of looking it up somewhere. None of them provided concrete information, except for one who sent me to the wrong bus.
		Way of providing information	In London the personnel is perceived as very polite and even though sometimes cannot provide information the form is appreciated by the traveller, as a sense of care is provided by the personnel.  P.E. The personnel however tried to help (even from their own experience) and were really polite giving the users a good sense of customer service.
		Location of assistance	No data is available concerning a public transportation location of assistance in London.
		User assumption “asking the service personnel is best”	In London some travellers also selected to talk to service personnel rather than use the self-service touchpoints available, as it seemed easier to the travellers. Due to the fact that in London service personnel is available at almost all stations and in a large amount it is facilitated for travellers to approach them.  “They have machines, but I like to buy it with the people in front of me. Just because for me it’s easier I don’t have to look at the screen I just ask what I want and that’s it.”
	Public transportation signage	Unclear signage	In the case of the tube in London the signage seems clear to the users, also to international travellers not familiar with the system, it communicates lines, directions, exits etc. efficiently. “Here we have been moving around only, and everything is well indicated: where to go, how to get there. So, it is very easy for the people who come from other countries I think.”
		Signage style	No data is available concerning the style of the signage in London.
		Signage location	Due to the fact that some train stations in the city are large finding the signage sometimes is a challenge for travellers. On the one hand the overview of the station feels clean and comfortable and on the other at some instance it might be harder to get the information required from signage as the signage itself must be found first.
		Amount of information	The information provided in the tube is relatively detailed and often targeted at travellers/tourist as it concerns information related to attraction and the public transportation.  “Yes, (information is) more than enough and in every stop they are like “This is the stop for this and this and this and its an exit only so if you don’t want get caught in the cue go one more stop and have a nice long walk.””
	Spatial orientation	Google Maps & smartphone usage	No data is available concerning the usage of Google Maps or smartphones in London.
		Public transportation maps	Simplifying the train system into visual with coloured lines and different transportation modalities had the impact on the public transportation experience of this traveller that information regarding the usage was not provided even though the modality types and spatial orientation was clear but know how to use the system in terms of ticket validation.  P.E. The station I was looking for was not a tube station and therefore I was not sure whether I could use the Oyster Card on the train from Heathrow Airport to that station and found no source of information that clarified this at the moment of use.

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		Mental state	One of the traveller's interviewed in London opened up about her feelings when interacting with the transportation system for the first time. She perceived it as difficult as she was new to the context and required some adjusting time. This is not a London specific case and the only concrete information about a travellers feelings during first time use, however it provides insight to the another aspect of the travellers experience less related to the public transportation as a product or service, but to the situation of use, especially at the instant of first contact with the system. "Yeah, only the first time it was hard, but the it was ok. It was hard just the situation you are here for the first time and a lot of people in one place and you need to, a little time to for orientation."
	Language problems	Confusion between modality types	No data is available concerning confusion between modality types in London.
		English insufficient	Due to the fact that in London all information is naturally communicated in English problems related to language did not surface on my personal experience. Furthermore no data is available concerning language problems in London.
	3. Ticket selection	Reason	Length of stay According to service personnel in London in 90% of the cases international travellers best option is to purchase the Oyster Card regardless of the length of their stay as it is the cheapest option and as easy/hard to purchase as other types of tickets.  Price In London the price factor also affects users when they purchase their tickets, especially single journey tickers as the price is fixed. Nonetheless when it comes to the Oyster card it is rather hard to know how much a journey will cost, making price less of a relevant factor when deciding what ticket to purchase but a relevant aspect of transportation usage and searching information within the travellers experience. TFL has various ways of calculating how much a person has to pay for public transportation, hence it is complicated to understand what are the factors to take into consideration, like the zones, the daily capping, the difference between bus and tube and the peak and non-peak hours.  "Well I think it is confusing, because although we put 15 pound on it I'm not quite sure what it is going to take off every time we use it."  P.E. In general I had no idea how much money I was paying for public transportation, being bus or tube, with the Oyster card in London.  "I'm getting well I'm taking this ... wow it's six pounds for one? Is that right? One day, n I don't want a ticket..."  Extra benefits In London the "London Pass" provides extra benefits to travellers, meaning attraction tickets or discounts, together with public transportation tickets. However through the field research only one traveller interviewed had purchased the pass. The traveller seemed satisfied with the pass. The advertisement of the pass is often to be seen especially at visitor centres.  "We have a Oyster card, the Visitor Card – with the London Pass, we didn't get at the station or anything we got it previously already...we used the (London Pass to go to the Windsor castle)."
	Other influencing selection factors	"Non-selection": Visiting friends/family	In London situations regarding visiting friends and family concerned the ticket selection and the way-description. In both cases the travellers received information but had to interact with the touchpoints themselves, however had the information of what they needed to use previous than travellers that for example arrive and do not know what ticket they should buy nor exactly from which station to which station they should travel and must figure it out during their travel journey.  "A ticket for one week with bus and metro, underground. He explained me (His friend, who lives in London explained what ticket to buy)."  "Well I have a friend who is here right now and she says to take the underground to Piccadilly and the transfer to Tower Hill."
		Selection through service personnel advice	In London, compared to all the other locations the service personnel usually recommends the Oyster Card to travellers as it is the cheapest travel option and as equally as complex to obtain as single journey tickets. In general this advice is embraced by the travellers making their public transportation travel experience, especially when using the tube more seamless than with other types of tickets.  "...but we came here three days and we used the Oyster Card. (We bought it) in Kings Cross station at the machine, but it was with the help of a man, because we didn't even know that this card exists even. We were about to buy a ticket, a paper ticket, but and then we asked to the service man and then he told us about the Oyster card."
		Operator complexity/compatibility of tickets:	No data is available regarding operator complexity/compatibility of tickets in London.
		Moment/ Location of Journey	In London the most Oyster cards are sold most on Fridays and in early December at Heathrow Airport, Victoria station and Kings Cross station showing the impact of cards purchase by travellers and the vitality of the locations at which the are sold at. Furthermore the Visitor Oyster card is successfully being sold within visitor holiday packages, Easy Jet flights and Euro stars, context and locations relevant to international travellers.  P. The station sales are about 45-50% of all sales. ...The places that sell the most Oyster Cards are Heathrow Airport, Victoria Station and Kings Cross station. You can see a pattern, the most cards are sold on Fridays and in early December and summer. It is because people come in, so visitors are an important factor considering these numbers.  P. When buying a Visitor Oyster Card a 3 pounds deposit is charged, these are sold online, but also within holiday packages, Easy Jet flights and in some trains like the Euro Star. The holiday packages are selling unexpectedly more than the magnetic tickets.
		Selection based on	According to service personnel in London usually the travellers with an Asian background are the ones who are

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		previous knowledge	<p>informed, at least to a certain extent about the tickets they should purchase - in specific the electronic cards -- and compared these to travellers of other nationalities, who mostly inform them selves on the spot at the moment of arrival. This might have many reasons regarding cultural aspects, but also be related to previous experiences of the travellers. The analysis of the ticket selection regarding having (no) previous knowledge can be found in the Cross-Case Analysis section.</p> <p>P. The tourists who prepare most often are the Japanese, Chinese and Korean. They already know roughly what they need. The Americans are the ones, who do not know anything.</p>
		Selection without previous knowledge	
TOPIC 4: Ticket purchase at ticket vending machine	TVM Interface	Ticket names/information or benefits not clear	No data is available regarding unclear ticket names/information/ or benefits in London.
		(Unclear) use cues	No data is available regarding unclear use cues in Denmark.
	Payment method	Bank/credit card declined	<p>In London the bankcard (or credit card) payment at ticket vending machines is sometimes a problem for travellers as the card with chic they intend to pay does not work and they are obliged to switch cards or find another alternative. This situation can be the trigger of a negative perception of public transportation system, at least a negative experience for travellers at an important phase of their travel journey.</p> <p>"A: We are going to have to use your credit card its declining my card... B: ...and we are having problems with the machine."</p> <p>„It was (easy to buy) except for that my credit card doesn't have a chip on it and I had to use someone else's, that was the issue, but other than that it was super easy – other than that it was super easy."</p>
		In cash, only coin payment available	No data is available regarding cash payment in coins in London.
		OV-chipkaart/ bankcard reader location:	No data is available concerning card reader locations at ticket vending machines in London.
Public transportation usage	First time use	Lack of usage information	<p>O. /P.E. At the gates if something went wrong with the ticket or Oyster Card people have the only suggestion on the screen is to "seek assistance" – most people try again, in some cases the gates then opened, if not people usually go to the service personnel standing around. Neither the gates nor the personnel give feedback on what went wrong at that moment but just open the gate and let people pass.</p>
		Feedforward	<p>The usage of the Oyster Card is straight forward in the tube, because of the gates and also in the bus as people can only enter the front door and usually exiting the back door, which has no validator. The gates in the tube provide information to the travellers about validation as it is inevitable to entre the system without validating at the gates. The insight in this case is related to the way feed forward manifest itself in the system and how it affects travellers' journeys, which in this case specifically is preventing them from making mistakes naturally providing a more seamless journey. Furthermore announcements in the tube providing detailed information about the following stop(s) is perceived as positive by travellers unfamiliar to the system and to the context of use.</p> <p>It was also experienced that sometimes feed forward is provided by other travellers and not only by the public transportation company touchpoints.</p> <p>P.E. The "touch-in" and "touch-out" was no problem at all, as the gates will not open if you don't do so. Also I just observed how the people surrounding me were using it and did the same.</p> <p>P.E. The first time in the bus I also "touched-in" as all people were doing s and the bus driver was watching if people did, on the way out there is no validator and as I drove for a few stations I observed how others did it and no one "touched-out" so I didn't either.</p> <p>"(The system) is great. Yes, (information is) more than enough and in every stop they are like "This is the stop for this and this and this and its an exit only so if you don't want get caught in the cue go one more stop and have a nice long walk."</p>
	Technological issue	Gates	No data is available concerning gates in London.

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### Hong Kong

Topic	Subtopic	Property	Manifestation (+ quote)
1. Choice of transportation	Selection by convenience factor	Accessibility	<p>Concerning accessibility in Hong Kong the travellers mentioned the possibility to travel during the night as being of prime importance. Even though some travellers appreciate the fact that the services run until late night, travellers arriving to the airport late usually take a taxi and not public transportation.</p> <p>"It is quite good it is quite efficient, so there's are lots of buses over night and also the MTR is running into really late as well, so yeah I find it quite linear."</p> <p>"On this trip, we just arrived last night. Actually we have not used public transportation, but taxis on this trip. We arrived late, so after midnight. So it was easier."</p> <p>"I took a taxi (from the airport to the city). I was getting off a late night flight and I was staying over by Chinese University, which is kind of little ways off, so I check the times that it was going to be sort of more than an hour one way."</p>
		Comfort	<p>In Hong Kong the aspect of comfort exposed itself during airport specific situations. The airport express being designed for travellers has plenty of space for luggage, power supplies with all types of entrances and a refreshing atmosphere. However some travellers explained that their decision to take a taxi from the airport to the city is related to them having to transport luggage, which is perceived as more convenient in a taxi.</p> <p>"In actual fact, when I first came to the airport if I'm travelling myself with luggage I will take a taxi. Yes mostly (because of the luggage) because I find it quite much easier."</p> <p>"(From the airport to eh city) taxi. It's easier it is more convenient, we had a lot of luggage, a lot of luggage."</p>
		Distance	<p>In Hong Kong the distance in the city was not mentioned explicitly, however many travellers instead that they would rather walk. This decision can be paired up with the thought that they want to see the city and get to know places. The places where these travellers were interviewed were far away from the city (centre) hence it is assumed that they only used public transportation to get there as the places are not within walking distance and everything else they do during their travels is walking distance, therefore they opt to walk.</p> <p>"A: I think so (that the Octopus card) is convenient) but we are not probably going to use public transport that much, walking."</p> <p>"B: We are walking a lot"</p> <p>"Yeah, because we crossed several times to Hong Kong island by the ferry, we took a ferry and otherwise we walked."</p>
		Efficiency	<p>On the MTR journey planner the user can say from where to where he/she is going. The website only requires the stations the users are going from and to and not the time. The online MTR journey planner provides the approximate travel time from station to station (eg. 32 minutes).</p> <p>MTR confirmed that the time is not available as every few minutes a metro-train is on each station. The system is very reliable and the lines come every few minutes making it very convenient for the users to only go to the station without having to be restricted by fixed times and providing a sense of efficiency in the MTR system.</p>
	Selection based on Experience	Failed attempt to use public transportation	<p>In Hong Kong there were travellers, who intended to use the public transportation system, however failed at it due to the understanding of how to use the system. This material is relevant, as it proves that these kinds of situations happen, even though amongst the qualitative interviews carried out most travellers in Hong Kong did know how to use the system. The insight provided by these examples are the reasons for this situations to happen. In one case it was due to an orientation issue, as the travellers did not know where they were going and in the second case the travellers are under the impression that not enough information was provided to them at the moment when it was relevant at their arrival to the airport.</p> <p>"We tried (using the metro). We didn't know where we were going, we went in and walked around for 15 minutes, then left."</p> <p>"And no, we simply couldn't find out how the coach system works. No, we couldn't find the ticket counter. Nobody spoke English, so we followed the signs to "Coach, Buses, Taxi" and then when we got down stairs there was coach, but they would not sell us tickets. We found out afterwards we could walk back to the arrival and bought one in the stand up there, so we just took a taxi. Well it was confusing, when you first come in, because all the signage doesn't explain where they are or what the process is and there was no real literature."</p>
		Public transportation assumption or bias	<p>Some travellers, also in Hong Kong, are under the impression that the electronic card for payment in public transportation is not worth purchasing as a tourist, but would be worth purchasing as a local. One of the interviews provided the insight that assumptions are made about the amount of money on the card. This aspect is apparently an decisive matter for the user.</p> <p>"If I lived here I would probably use it, but not as a tourist. I don't know, I don't see the point of toping things up that I am not going to be using. Yeah maybe (it is too complicated) or something like that and then you might put loads of money and might not end up using it and have a card that you spend money on it."</p>
2. Searching Information	Service Personnel	Type of information requested	<p>The type of information requested from the service personnel in Hong Kong, especially when using the MTR system is very related to the usage of the MTR system. When using the MTR system travellers are usually underground and the information they request at that location is from only one company and at that moment of use. However the personnel responds to other sorts of information as well. At each station there is information available concerning the surroundings of the station in terms of buildings, shopping areas, etc.</p> <p>"Yes (we bought the ticket at the ticket vending machine), the first time we were confused, but a lady helped us so since then its been fine."</p>

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			P.E. I asked questions about what is the best ticket option to purchase in a specific situation or what is the bet option to reach a place from the station I was at.
		Way of providing information	<p>In Hong Kong the personnel is perceived as efficient and knowledgeable, however the traveller might feel rushed and insecure about asking again.</p> <p>P.E. The lady at the service desk in the airport where I bought the Octopus card was very fast. I had the feeling that she was rushing to keep the flow of the cue going, even though I would have liked to ask how the card works I did not even get the chance to. When she gave me the card and I paid she quickly explained the deposit and I didn't really understand because it was too fast. I had not put my things away when the following customer was called.</p> <p>P.E. Yeah, it's a card. (We bought it) in the service desk. Yeah they were really fast. It was nice, but they were a little bit too fast, because we came from Thailand and you know in Thailand everything is slow and now we get "Oh here your ticket, you can go there, there, there, thank you." We are so: "What?" Yeah, (I would like) maybe that they are a little bit slower and breath and then it was...but I know they are used to do it 24 hours and so I think they are bored and...</p>
		Location of assistance	<p>The points (gates and tracks) at which service personnel stands in Hong Kong seem to be the ones where most people need assistance.</p> <p>O. The service personnel at stations stands usually in the service booths between gates and exit, but some personnel is also standing at the metro tracks.</p>
		User assumption "asking the service personnel is best"	<p>In Hong Kong many travellers purchased their tickets at service desks, often because it seemed easier and it was often mentioned that at the moment of time the cue at the desk was shorter than at the machines. Service desks are available at all stations, however considering the size of the stations the number of walking service employees perceived to be available is relatively small, making the option to approach service employees less attractive.</p> <p>Just a straight one-way ticket into town. At the counter. Never done it before – I thought it would be easier if I had problems I have a person to talk to. No (we didn't inform ourselves about ticket option before arrival). Yes (in the city) we will probably get an Octopus cad, but we will probably talk to our concierge.</p>
	Public transportation signage	Unclear signage	<p>In Hong Kong the signage for public transportation is available at many sports and mostly provided in a very clear fashion. The fact that at stations the exit signage is placed in the same way as the exit from the perspective of the user is a good example for the clear information communication it has. Furthermore all sorts of information is always additionally provided in English, making the information communication available for as many (international) travellers as possible.</p> <p>"There is information everywhere, you know where to go, there are names of exits and so on."</p>
		Signage style	<p>The style of the signage in Hong Kong is very colourful compared to other signage experienced. However the colour coding is helpful for way finding. In some cases the signage style is different than the signage of the travellers expectation as it often is animated or uses images to explicate. For some travellers this style is often related to advertisement or comics and not to official information communication. For the international travellers this aspect however is not perceived negatively, but merely different and takes a brief moment of getting used to, however does not interfere with receiving the intended information.</p> <p>P.E. Making the interchanges was really easy, the colour coding of the signage was very clear to me and I felt secure about what I was doing.</p> <p>"M: Fine excellent, it was very easy (buying this ticket). So far so good.</p> <p>F: We found it without stumbling around so much, for me it was like there was the big add across the top when we came through but I was like "Is that to the train?" Because when you come form the arrivals section there is a sign that says "To city" and the symbols for you know trains and buses and all that the way to go. Then Brian said "That's the big train" and I though "Is that an add?"</p>
		Signage location	<p>The location of the MTR signage is strategic in the sense that it guides travellers from early stages in their travels, in many cases from the street to metro station, but also inside of the stations during all processes of entering, using (eg. interchanging) or exiting.</p> <p>P.E. At my hotel station Tai-Wao-Hao the signs were also clear and the hotel was pointed out.</p> <p>O. Finding the closest MTR is really easy, as the MTR signage is also outside on the streets, for instance on a pedestrian bridge.</p> <p>O. The signage also includes information for people who cannot use the stairs and guides the users in the right direction as early on as possible in the process.</p>
		Amount of information	<p>The amount of signage attracts attention positively when using the MTR system as it accompanies the travellers thought their whole journey. This aspect is of mayor importance for international travellers, who are not familiar with the system and require the information more than frequent travellers.</p> <p>"I think it is quite good, there are always signs around you always know where you are going and how much things are and there is also like a little app that you can download for the MTR ..."</p>



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			P.E. In the regular metro I was impressed by the amount of signage and feedback I received as a user. I immediately knew what to do, even on which side of the door to exit, as the little light by the door points out.
	Spatial orientation	Google Maps & smartphone usage	<p>During the field research in Hong Kong several user interviews provided the information that Google Maps is a tool relevant to the experience of international travellers as it is a tool used by many travellers in order to find their destinations and the way to their destinations which in many cases is public transportation together with other internet related tools such as apps and in general smart phone.</p> <p>“(Way finding) was quite easy, I’ve been using my phone a lot so I...Google maps, yeah - yeah I’ve been wondering around, but there are a lot of maps posted around the city so it seems very nice, very mappable.”</p> <p>“(I downloaded ) This Big Bus, from the Big Bus company, because then you have a kart (map) from Hong Kong and you can see where the stops are and also information about the places and it is really nice.”</p>
		Public transportation maps	<p>People not familiar with the system or the city need the full depiction of the map in order to orientate better. Simplifying the train system into a visual with coloured lines had the impact of a public transportation experience that lacked useful orientation information to reach further destinations.</p> <p>P.E. The MTR line map is simplified, at the beginning of my Hong Kong stay I could not realize that some lines do to the other side/ the other island. The lines are shown without showing the “actual” map, at least on the small take-away maps and on the depicted metro lines.</p>
		Mental state	No data is available concerning the mental state of travellers at specific travel instances in The Netherlands.
	Language problems	Confusion between modality types	No data is available concerning confusion between modality types in Hong Kong.
		English insufficient	No data is available concerning the English language in Hong Kong.
	3. Ticket selection	Reason	<p>Length of stay</p> <p>In Hong Kong several people described the reason to not purchase an Octopus card in terms of the length of their stay. One of the travellers did not even consider a smartcard a convenient option for a stay of one week. Usually travellers purchase single tickets as these are perceived as very cheap for many traveller, show compare the price of public transportation to their own countries.</p> <p>“Yeah no, I only am here for seven days I don’t need a card to put money on it here.”</p> <p>“Yes (I have heard about Octopus), we are only here for a few days and it wasn’t worth (buying it).</p> <p>“Yes we know (about the Octopus card), no we (haven’t used it) because we don’t have any need to use it. The communication system is very cheap so there no need to buy, our trip was very short so.”</p>
			<p>Price</p> <p>In Hong Kong public transportation is perceived as very cheap, hence purchasing an Octopus card seems as more of a hassle to travellers than just buying any other types of tickets or even selecting another transportation modality.</p> <p>“We thought about getting one of them (an Octopus card) at the station. We will see how much they cost first, so it depends, we just came from Singapore, we bought one similar there and we just used it twice.”</p> <p>“Yes we know (about the Octopus card), no we (haven’t used it) because we don’t have any need to use it. The communication system is very cheap so there no need to buy, our trip was very short so.”</p> <p>“Taxi. Because if it is two persons it is more convenient, because you pay less.”</p>
			<p>Extra benefits</p> <p>In Hong Kong an extra benefit of the public transportation system , in specific of the Airport Express, is the option provided to travellers to drop off baggage in the city centre and then use the public transportation to the airport. Furthermore the “Airport Express travel pass” provides the transport from the city to the airport and back and a regular Octopus card. The price o this pass includes a certain amount of hours (eg.48hrs) of Octopus usage. The card can be recharged when t he time is over, however travellers who purchase this sometimes do not know that they are allowed to recharge the card and therefore search for alternatives making the travel journey more complex without it needing to be.</p>
		Other influencing selection factors	<p>“Non-selection”: Visiting friends/family</p> <p>In Hong Kong some of the user interviews were made with international people living in Hong Kong, who referenced their experience when they have visitors from their home countries. In this case the travellers explain that the ticket they select or recommend for their visitors has usually to do with the length of their stay and in some cases with the amount of use the travellers will have for the ticket. The Octopus card was only considered relevant with longer stays and if the travellers have further uses for the card like paying in retail. This information provides insight on what considerations the friends an family of the visiting travellers have in regards of the ticket selection.</p> <p>“I think it depends on how long they (visitors) will stay, if they are only staying for a few days then maybe then I’ll just tell them to get a single journey one, but if they are staying maybe a week or something then its mote convenient to get the Octopus card.”</p>
			<p>Selection through service personnel advice</p> <p>In Hong Kong one single specific instance related to advice by service personnel was related by travellers, who obtained a ticket for a transportation method that they did not expect from the service personnel and found themselves in the situation of having to use a transportation method they didn’t intend to. This situation caused their public transportation experience to initiate roughly, however did not affect the travellers much as they were able to get to their destination, which had a bigger priority.</p> <p>A: It was a wrong ticket. B: It was from the desk. A: We told them and then she said 20 Hong Kong Dollars B: We said we want to got to the city and then we paid I don’t know... A: 20 Hong Kong Dollars and then she said ok here is the ticket. And after we went to the bus, we have only to go three stations and with the 20 dollars we have to drive a lot of stations. So, no it was not so good, but also not really bad.”</p>
		Operator	No data is available regarding operator complexity/compatibility of tickets in Hong Kong.

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		complexity/compatibility of tickets:	
		Moment/ Location of Journey	<p>In Hong Kong the airport and main stations are main ticket purchase locations. Paying for bus rides when getting into the bus was also described by traveller interviewed, showing the more incidental way of purchasing tickets (although in the buses no actual paper or receipt is provided after payment in some buses). Furthermore the usage of the Octopus card by the tourists, who actually do purchase one, is appreciated in the sense of the extra benefit that the can purchase with the card in retail is perceived as convenient.</p> <p>„We found out afterwards we could walk back to the arrival and bought one in the stand up there, so we just took a taxi.“</p> <p>“(I loaded my card) in a 7-Eleven, so in the convenience stores. It is quite good, because you can use the Octopus card not just for public transport but also to buy something in a convenience store, so I think it is quite a good system – it is easy to top-up whenever I need, yeah its really convenient.</p> <p>... but usually I'll do it when I'm in the store, because I'll be buying something at the same time so it is just easier to do.“</p> <p>P.E. After the baggage claim I directly saw the service desk that sells Octopus cards/public transportation tickets and went there to buy mine.</p> <p>“A: We have an Octopus card....It is really convenient. B: It is great that you can use it as a pay pass also in stores.”</p>
		Selection based on previous knowledge	<p>Travellers in Hong Kong, who purchased their tickets at the airport usually were satisfied with the purchase of tickets as it was efficiently solved, no matter whether they had actively informed themselves previously or not.</p> <p>The analysis of the ticket selection regarding having (no) previous knowledge can be found in the Cross-Case Analysis section.</p>
		Selection without previous knowledge	<p>“Just the regular round trip tickets. (Have you considered using the Octopus card?) No, what's that? No, I don't think so this is easy. Yeah (I bought it at the service desk). I don't know it is what I always do. Very good, it is quick fast, easy. It is easy to get very fast to the city centre. It's always easy, this airport is very easy.”</p> <p>“From the airport to my stay) by bus. (I found out) in internet information. It was a public bus, I take a bus to Kowloon and I stay in Kowloon. I have bought a ticket before in the ticket desk. It was very easy – I was surprised, but it was very easy. Yes, yes, everything was good and I have noticed all information by this (signs).</p> <p>Metro, metro station. I bought Octopus card. Also in the internet information. I bought it in the desk. It was good I have no troubles, it was very good.”</p>
TOPIC 4: Ticket purchase at ticket vending machine	TVM Interface	Ticket names/information or benefits not clear	No data is available regarding unclear ticket names/information/ or benefits in Hong Kong.
		(Unclear) use cues	<p>In Hong Kong some international travellers who purchased their tickets at the machines explained their pleasant experience when selection and purchasing a ticket at the machine. The relationship between these statements was that they only had to select where they have to go to. This information suggests that rather than figuring out what ticket is best the machine offers the opportunity to base the selection on the location the travellers need to go to.</p> <p>“Machine, it was very easy you just have to press your destination, your stop and they calculate automatically the total. It's very easy (to find the right way).“</p> <p>“I just a one-off (ticket). (I bought it at) a vending machine, extremely easy – I was very impressed by the...I think I just I think with the vending machine I just touched the place on the map that I wanted to go. It was quite nice.”</p>
	Payment method	Bank/credit card declined	<p>In Hong Kong this situation was only reported once amongst all interviewed users. However the user whom it happened to had to spend a part of his touristic experience in Hong Kong searching an alternative to purchase a ticket.</p> <p>“First at the ticket machine it didn't take card so I went to the ticket office.”</p>
		In cash, only coin payment available	No data is available regarding cash payment in coins in Hong Kong.
Public transportation usage	First time use	OV-chipkaart/ bankcard reader location:	No data is available concerning card reader locations at ticket vending machines in Hong Kong.
		Lack of usage information	No data is available concerning lack of usage information in Hong Kong.
		Feedforward	<p>In Hong Kong the public transportation system provides guidance to the travellers through their journey spread across several touchpoints, from the moment of access to stations, the way of entering a transportation vehicle and the place where the vehicle is located at. These types of guiding elements make the experience of all travellers but especially of travellers not familiar with the system, more seamless than if they were not provided.:</p> <p>Due to the gated system first time users have a clear guidance on what to do and can easily go through the system without major issues.</p> <p>The organized entering of public transportation modalities seems to be a cultural aspect. For international travellers not used to this it is not a problem to be a part of the organized system as it is the only way to be a part of the system. The context is adapted to guide travellers to enter and exit transportation modalities in organized matter.</p> <p>Furthermore thought the travel journeys with the MTR lines and with the Airport Express visual feedback is provided with maps and light providing information regarding the location of the vehicle and the previous and next stops making it clear for travellers not familiar with the route to be oriented and easily find their stop.</p> <p>P.E. When leaving (or entering) the Airport Express I had to check-out with the octopus card but that was really</p>

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			<p>straight forward as there were gates which I had to pass.</p> <p>“Whenever you finished your ride you just put them (the paper tickets) there in the machine. “</p> <p>P.E. Entering the MTR trains and the bus happens in a very organized matter as people are guided to wait in line - a metal rod by the bus keeps people in lined up.</p> <p>P.E. As a first time user of the Airport Express line the visual feedback of the journey is a good help to know not only where the train is at, but also how long the journey will last.</p>
	Technological issue	Gates	No data is available concerning gates in Hong Kong.

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### Denmark

Topic	Subtopic	Property	Manifestation (+ quote)
1. Choice of transportation	Selection by convenience factor	Accessibility	In Copenhagen 80% of the city is only 600m away from a train/metro station and travellers have all options in a relatively high frequency making the public transportation system accessible for travellers.  P: "Metro every 4 minutes, trains every 15 to 20 minutes, some trains every 20 minutes, and buses every 6 minutes."
		Comfort	The aspect of cleanliness related to the Copenhagen metro surfaced as relevant when describing the usage of the transportation modality, making cleanliness a relevant factor that makes public transportation more comfortable hence a nice transportation option to use.  P: "For tourists the metro is one of the preferred ways of public transport ....Also it is cleaner."  "We used the metro, bus once and train as well. They are pretty nice, I mean we both live in London and that is a city, where the transport is probably excellence of the world and I think here the trains run quite frequently and are pretty clean. I thought it is really good."
		Distance	In Copenhagen many travellers, tourists, opted for the option to walk due to the possibility to see the city and attractions on foot.  "We've been walking everywhere through he city, oh yeah we took a boat, but that is like a private company."  "No, we only got eh ticket to get here (from the airport ot the city). We do everything byfoot. Here in the city (there is no need to use public transportation).  A: We arrived in Copenhagen airport.(From the airport we travelled) on metro. We bought tickets for three the zone, one ticket, 36 Kronen. No, we just walking (in the city). We didn't want to use because we like to walk. ... We don't use transport so many to buy these tickets. The distance not so far, not so long, so we B: We found the Copenhagen is not a big city for walking.
		Efficiency	Due to the fact that the public transportation modalities run in a high frequency a sense of system efficiency is provided to travellers at Copenhagen airport and throughout the system, also at other locations, as the frequency is kept. This information however is not sufficient to assess the efficiency of a single trip.  P: People have many options to go to and from the Copenhagen Airport (metro, buses, trains) in a high frequency (Metro every 4 minutes, trains every 15 to 20 minutes, some trains every 10 minutes and buses every 6 minutes), therefore there is never a total closedown, the flow of people is kept. If you miss one you just take the next one.
	Selection based on Experience	Failed attempt to use public transportation	In Copenhagen one case related to users failed attempt at using public transportation did not affect the selection of transport, but the approach of purchasing a ticket. The users searched for a service desk at the station, however were not able to find one and opted to use a ticket vending machine. The situation of purchasing the ticket at the ticket vending machine has other qualities than when tickets are purchased with service personnel, which affects the travellers experience with the public transportations system.  "Today we wanted, we were looking for a service desk but we couldn't find it (at Copenhagen Central) and yeah so we just went to the machine."
		Public transportation assumption or bias	No data is available concerning a public transportation assumption or bias in Denmark.
2. Searching Information	Service Personnel	Type of information requested	The public transportation employees only work until 20:00hrs, however the airport is busy with arrival until 22:30hrs and some flights arrive up to 01:30am. This means that people are asking questions about public transportation all the time and now the airport employees are the ones helping, but just what they know as users themselves.
		Way of providing information	In Denmark the Copenhagen Airport service personnel is trained to not act for the travellers but to only explain to the travellers, for example when the traveller is interacting with a ticket vending machine. This approach can be perceived either as positive or negative by the traveller, however no specific data providing this information is available. Nevertheless the fact that it is a conscious decision by the company provides a different approach worth considering in respects of how travellers are provided with information by service personnel.
		Location of assistance	In Denmark there is service personnel walking around at the train stations and in the airport at the metro entrance. At the airport it was observed and experienced that the assistance proactively approaches users, while in the train stations it is less. An interesting fact at he airport is that even though there were cues equally long for ticket vending machines and service personnel many people still opted for the service desk cue rather than the ticket vending machine.  P.E. When I was looking at the information board before entering the metro a service person approached me and provided me with the flyer that contained the information and metro map.  O. Although most people seemed to buy their tickets at the ticket vending machines, people spread between ticket vending machines and ticket office.
		User assumption "asking the service personnel is best"	No data is available concerning user assumptions that service personnel is better in Denmark.
	Public transportation signage	Unclear signage	No data is available concerning unclear signage in Denmark.
		Signage style	Since 2015 there is DOT, which translates to "Your public transport", it is an umbrella organization that provides travel information and tickets. The aim is to have one single face of public transportation, as previously every company had their own way of communicating. DOT is cooperation between the public transportation companies. Providing information to customers in one single style provides the public transportation system users a sense of security as they are serviced by one entity no matter how many transportation modalities (companies) they use during their journey.
		Signage location	No data is available concerning signage location in Denmark.

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		Amount of information	<p>Depending on the context the location of the signage is an important factor, which when not found is perceived as lacking by the travellers. The experience of some travellers in the Copenhagen Airport is that not enough signage is available in regards to public transportation.</p> <p>P. The Copenhagen Airport is continuously working on improving the signage:</p> <ul style="list-style-type: none"><li>o People still ask “where is the metro?” and ticket vending machines.</li><li>o There are rules on keeping advertisement signs low and always prioritizing signage.</li><li>o It has been an improvement since the public transportation companies agreed on one communication style.</li></ul> <p>“A: We took the train from the central station to the campsite. S-train. (Finding information was) really bad. Yeah! B: There is no sign for- A: At the airport everybody was asking which train to take to go to the central station. Everybody got lost at the airport. And at the central station every desk was closed. So we just asked, we just had to ask to someone to know which train to take to go to the campsite and no signs at all.”</p>
	Spatial orientation	Google Maps & smartphone usage	<p>During the field research in Denmark the information that Google Maps and other smartphone related methods are a tool of mayor relevance to the experience of international travellers journey in terms of finding their destinations and the way to these destinations, including public transportation, surfaced.</p> <p>“I have a Google maps, so I usually can like plan exactly which train I need to get on for the most part... Yeah I think it's been pretty easy, but like I said I rely on my phone pretty heavily. Yeah I go to a lot of places with wifi. Then I'll plan before hand and then I'll just know where to go then take picture screen shots or something and then I'll be good.”</p>
		Public transportation maps	<p>The complexity of the zones is something the passengers have problems understanding. A zone system not necessarily is hard to understand, however the depiction of the public transportation map is confusing as travellers might be misled by the colours. People assume the colours are the zones, but the zones are depicted by small numbers per area. Simplifying the train system into visual with colours and number has the impact on the public transportation experience of traveller that the ticket selection might be wrong due to a wrong understanding of the zones and likewise that a ticket for specific zones is wrongly used in other zones, being a cause for further negative consequences.</p>
		Mental state	No data is available concerning the mental state of travellers at specific travel instances in The Netherlands.
	Language problems	Confusion between modality types	No data is available concerning confusion between modality types in Denmark.
		English insufficient	No data is available concerning the English language in Denmark.
3. Ticket selection	Reason	Length of stay	<p>In Copenhagen the tickets purchased by travellers usually are the single use 3 zone tickets from the airport to the city or the two zone tickets in the city. The tickets for a longer use, like the 24 and 72 hour tickets, as well as the Copenhagen card are purchased less indicating that less travellers consider buying a ticket for a longer length.</p>
		Price	<p>It is very expensive to get Rejsekort. The Anonymous Rejsekort costs approximately 10 Euro and the minim amount that must be in the card travel with the trains is approximately 80 Euros. To refund money people msut write a letter to the company, which takes time in being processed.</p> <p>“A: We bought tickets for three the zone, one ticket 36 Kronen. No, we just walking (in the city). We didn't want to use (public transportation) because we like to walk. B: Now it is very expensive because of crisis. A: Especially for Russian Rubble. B: Very expensive now.”</p>
		Extra benefits	No data is available concerning extra benefits regarding ticket selection in Denmark.
	Other influencing selection factors	“Non-selection”: Visiting friends/family	<p>In Denmark travellers visiting friends were provided with the tickets for their public transportation by friends, in one of the cases the traveller was using a Rejsekort, that was not used by Copenhagen resident and in another case the international traveller did not know what kind of ticket he had nor how to use the transportation system as he relied on his friend, who did know the system. He mentioned that if travelling alone he would inform himself more but sees no needing his current situation, making his experience with public transportation based on the experience of the local. This type of situations can be further explored to provide insight regarding how the actual experience of the international travellers is when using public transportation with a resident of the city/country and how their travel journey is affected.</p> <p>“A: Yeah she gave me one so I could use it. B: I just gave her one of the Rejeskorts I had.”</p> <p>“I don't have the train ticket. My friend took care of me. Yes (I've been using public transport in the city) but only with friends, so not alone, cause I don't know very much about the transportation system here. Not yet ( I haven't bought tickets) and I don't know how to do this. Since I know that my friends will come and pick me up, so I didn't ( I didn't inform myself), but I'm sure that if I came alone I would certainly check how everything works in the city.”</p>
		Selection through service personnel advice	<p>In Denmark the reaction of a service employee to the type of ticket that was sold to me was interesting as my interpretation as he was glad that his colleague at the desk sold me the best option for my travels. Due to the reaction of the service employee I believe that many international travellers who do not know the system in Copenhagen/Denmark, who stay for a longer period of time than 72 hours pay more buying single tickets for every journey. I believe that if they don't know they don't mind but if they would find out they had another option they might be disappointed with the lack of information regarding options for people who stay longer than 72 hours. I interpret this reaction important and relevant because I think that often encounters travellers who purchase a ticket that is not of their convenience at the service desk, which might have different reasons on behalf of both the travellers and the personnel.</p>

## Appendix L - Individual analysis of The Netherlands, London, Hong Kong and Denmark

			P.E. The service employee asked me what ticket I have and was positively surprised that I had a flex card for 7 days. He said that he person who sold me the flex card was smart and nice as it really is the best option for a week-long stay.
		Operator complexity/compatibility of tickets:	No data is available regarding operator complexity/compatibility of tickets in Denmark.
		Moment/ Location of Journey	The Copenhagen Municipality sponsored an information wall and ticket vending machines at the baggage claim, which is successfully being used by locals and foreign travellers to purchase tickets. Providing relevant insight on the potential to inform travellers and sell tickets to travellers at a relevant moment and location within their journey.  O. Many travellers use the information wall and ticket-vending machines inside of the baggage reclaim area of the Copenhagen International airport.
		Selection based on previous knowledge	User interviews in Denmark provided the insight that from the traveller's perspective to it is not necessarily required to be informed about the public transportation system or the tickets previous to their travel. It can be that they perceive it as more convenient to search for the information on the spot rather than previous to their travel, which was for example not considered necessary or worth the time of some travellers, while other travellers prefer searching information. The analysis of the ticket selection regarding having (no) previous knowledge can be found in the Cross-Case Analysis section.  "A: We bought in the service desk, we will use (the ticket vending machine) when we come back. I don't know how to use it, So we will try. B: It is hard to understand A: We didn't see. We knew what kind of tickets we need and we just said that (at the service desk), just search in internet B: Google A: Google, a page for Russian tourist, which kinds of tickets to use, how the travel, what train."  „A: In Copenhagen, no (we didn't inform ourselves about public transport). B: This is the first stop of our big trip from many months so we just we will stay here just four days, so we didn't really do it."
		Selection without previous knowledge	
TOPIC 4: Ticket purchase at ticket vending machine	TVM Interface	Ticket names/information or benefits not clear	In Denmark at the ticket vending machine the situation of not understanding what the ticket options actually offer, made unclear which ticket is more convenient to purchase. As a traveller the best option was to approach service personnel and explain my situation of use and the reason of being confused at the ticket vending machine. In the situation in Denmark a much longer time was spent trying to figure out the tickets than proactively doing something about the lack of information that actually will help overcome the situation, providing insight on the aspects of the information and communication that could be further analysed and improved to improve the travellers experience with the usage of the machines.  P.E. It was not clear to me which ticket I should buy as a tourist that is staying in Copenhagen for 6 days, as the tourist offers are for 24 – 72 hours ("City Pass" or "Copenhagen Card"). The flex card seemed the best option, but I was not sure about what it provided me so I decided to ask at the service desk.
		(Unclear) use cues	No data is available regarding unclear use cues in Denmark.
		Payment method	
		Bank/credit card declined	No data is available regarding bank/credit card payment in Denmark.
		In cash, only coin payment available	No data is available regarding cash payment in coins in Denmark.
		OV-chipkaart/ bankcard reader location:	No data is available concerning card reader locations at ticket vending machines in Denmark.
Public transportation usage	First time use	Lack of usage information	In Denmark the public transportation system provides less guidance to the travellers making the usage for international travellers or travellers not familiar with the system, less seamless than if they were provided. One example is that the system is not gated and there are multiple ways available to validate tickets so the users are not sure about the way she should validate their tickets or simply forget. The lack of usage information causes the travellers to bump into problems of different types that might negatively influence their journey. Some of these bumps in the journey are solved easily when the travellers learn from their mistake, however in other cases the travellers lack information that that is relevant each other time at the same touchpoint or moment of use influencing their entire public transportation experience negatively, depending on the impact of the situation. The example of being fined for improper usage is perceived as unfair by the traveller.  "I just think that the way that they do it is kind of unfair, cause my sister had just been here and I was picking her up at the airport and I she had been here for probably ten minutes and it was my fault forgetting to check in, cause I have been here and they gave us both tickets, so yeah, besides that I like everything about it."  "...but we have been really confused by whether we need to validate our card or not. So it says the date on there – I guess it's just a one day pass. One of the paper things. And I know there are those machines (validators), but I don't really know what to do with them so we just hopped on and hope that it works."
		Feedforward	
	Technological issue	Gates	No data is available concerning gates in Denmark – there are no gates in the system.

