Considerations for a Service that enables Sharing Ride Experiences to and from the Airport

LAURA BECEDAS SEGERSTRÖM
Abstract

Although shared mobility services provide benefits such as minimizing congestion as well as pollution and costs of transportation, barriers such as trust and convenience are blocking these services from reaching a broader audience. In this paper, considerations for a new service that aims to bring together familiar strangers to share rides to and from the airport is presented using a Research through Design approach. The familiar strangers investigated in this study are frequent travelers of Scandinavian airlines (SAS). Interviews, ideation workshops, prototyping, and feedback sessions are the design activities that were used to understand motivations behind their choice of transportation to and from the airport, and current pain points that motivate the need for such a service, as well as to guide the design directions of the service to tackle the problems of trust and convenience current shared mobility services face. The findings showed that SAS travelers are willing to share rides with others belonging to their community when living far away from transit services to and from the airport, arriving uncomfortable hours at a new destination, when there’s a potential to make new business contacts as well as when traveling with loved ones. The final design presented in this paper serves as a framework on how to design services to enable people who share common physical spaces and similar travel behavior, to share rides together.
Sammanfattning

Considerations for a Service that enables Sharing Ride Experiences to and from the Airport

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ABSTRACT
Although shared mobility services provide benefits such as minimizing congestion as well as pollution and costs of transportation, barriers such as trust and convenience are blocking these services from reaching a broader audience. In this paper, considerations for a new service that aims to bring together familiar strangers to share rides to and from the airport is presented using a Research through Design approach. The familiar strangers investigated in this study are frequent travelers of Scandinavian airlines (SAS). Interviews, ideation workshops, prototyping, and feedback sessions are the design activities that were used to understand motivations behind their choice of transportation to and from the airport, and current pain points that motivate the need for such a service, as well as to guide the design directions of the service to tackle the problems of trust and convenience current shared mobility services face. The findings showed that SAS travelers are willing to share rides with others belonging to their community when living far away from transit services to and from the airport, arriving uncomfortable hours at a new destination, when there’s a potential to make new business contacts as well as when traveling with loved ones. The final design presented in this paper serves as a framework on how to design services to enable people who share common physical spaces and similar travel behavior, to share rides together.

Author Keywords
Sharing economy; Shared mobility; Transportation; Research through Design;

ACM Classification Keywords
H.5.m. Human Computer Interaction (HCI)

INTRODUCTION
The emergence of the “Sharing Economy”, a phenomenon that can be described as the “the peer-to-peer-based activity of obtaining, giving, or sharing the access to goods and services, coordinated through community-based online services” [16] is altering the way we live our daily lives and how we interact with strangers. Today’s digital technologies are facilitating the coordination of shared economy activities and helping us create new relationships that would have never been possible before without a face-to-face contact [12]. This phenomenon is helping individuals reconnect with their local neighborhood and elsewhere [19] and is taking off in all sorts of niches, including the transportation sector. Shared mobility can shortly be described as the shared use of any type of transportation mode. Shared mobility services, such as Uber¹ and Lyft², are new forms that have been introduced in order to bring together travelers with similar itineraries and time schedules [2] in one shared car. Even though sharing rides may provide important economic and environmental benefits, there is a need for people to feel comfortable enough to be willing to share that space with others. According to Belotti et al. [5], there is a significant need for sharing economy providers to take into account what certainly motivate users to participate in order for them to become successful. Social discomfort, as trustworthiness in other users and/or services have been discussed repeatedly as drawbacks for sharing rides [9, 14, 17, 23]. Other barriers are the scheduling and coordination of routes [15]. This actual situation requires looking for new potential ways on how existing mobility services can be redesigned or how new promising ones can be created to tackle these problems.

The main purpose of this paper is to contribute with a new potential way on how to bring together familiar strangers to share rides together. Zhang et al. define the term familiar strangers as “individuals who do not know each other but who share common attributes such as interests, occupations, and locations” [31]. This project focuses particularly on SAS³ travelers. Minimizing detours and maximizing social connection have been identified as two factors that could increase the social comfort level and trust among rideshare participants [15]. SAS travelers are all dependent on transportation

³ https://www.sasgroup.net/en/category/about-sas/
modes to and from the airport, and many may even share the same travel behavior. When traveling in the same flight to the same destination they are even sharing one part of their journey and the same schedule.

A Research through Design approach was taken to explore what characteristics are important to consider when building a service for SAS travelers to enable them to share rides to and from the airport. The final prototype presented is a result of the design activities that included interviews, ideation workshops, prototypes and user feedback sessions. It serves as a framework on how to design services that allow people sharing characteristics such as similar travel behavior, to share rides together.

BACKGROUND
In the following section, I will give a short introduction of shared mobility and discuss how trust is one important factor for its future development. Finally, I will expand on the term familiar strangers and explain how SAS travelers could be seen as such and also as a potential group for participation in ride sharing services.

Shared mobility
Shaheen et al. describe shared mobility as “an innovative transportation strategy that enables users to have short-term access to a transportation mode on an as-needed basis” [25]. Emerging shared mobility services aim to provide society with more sustainable mobility in cities, helping reduce traffic congestions and carbon dioxide emissions [1]. Some modes of car-based mobility services include carsharing, carpooling and ridesharing. Carsharing is a car rental service that provides short term access to cars [18], meaning that people or businesses rent out their vehicles for others to use for a short period of time. Some examples of businesses providing people with cars for short time use include Car2go⁴ and DriveNow⁵. Carpooling, on the other hand, aims to connect travelers going on the same direction in order to ride together and minimize the costs of the travel [24]. For instance, the company BlaBlaCar⁶ connects car drivers with spare seats with people searching for a ride for long-distances. Ridesharing services, like Uber and Lyft, are enabling with their digital platforms to connect drivers of private cars with people searching for taxi-like transportation. Ridesharing services often enable carpooling activities too, for example Uber with their service UberPOOL, meaning that customers can allow other strangers to join them along the route. The benefits for participants joining this form of shared mobility services include improved vehicle occupancy and reducing the transportation costs.

Trust: An important factor in shared mobility services
Trust has been identified as one main impediment for sharing rides [3, 9]. Sharing a vehicle with one or several strangers who one doesn’t know anything about may be difficult for many. Early research has shown the importance of being able to meet the person one will be sharing the ride with before making any arrangements [23], still few investigated to what extent they had to know each other before riding together. Many shared mobility services are tackling the trust problem in different ways. For instance, Uber installed a system for travelers to rate drivers as well as the other way around based on their ride experience [26]. BlaBlaCar, on the other hand, establishes a feeling of trust by building a social media-like platform allowing reservations [26]. Many of these services allow passengers and drivers to upload profile pictures, which could potentially strengthen the trust between passengers. Still, designing attractive mechanisms and suitable ride arrangements are two other challenges current services enabling people to share rides face [13].

Research has shown that the motivation to participate in sharing economy differs among different types of shared economy platforms [8]. When it comes to ridesharing services, environmental motivations are specifically important. However, when talking about carpooling services where prolonged social interaction is involved, social motivation could be more prominent than economical or environmental motivations [8]. When using a ride sharing service as Uber, a customer is experiencing the journey alone with the driver and may be able to decrease the social interaction between them. Instead, when using the carpooling application UberPOOL, travelers may need to be ready for prolonged in-person interactions, as they will be riding with one or more strangers, and the number of stops required may prolong the ride. In the paper “Instant Social Ride-Sharing” [15], the authors point out that user acceptance could improve by reducing detours and increasing social connections, as it could maximize the social comfort level and trust between passengers. According to Circea et al. [10], the acceptance of sharing rides is bigger among frequent long-distance travelers, particularly those who travel more by plane. Flying travelers usually share one or more common physical spaces (e.g. airport, lounges, airplane), investigating how this social connection could potentially bring them together to share rides is something that is worth exploring, since when sharing a

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ride with someone who is going to the same destination (e.g. airport) the number of detours could potentially decrease. Given that many sharing economy services include transactions between strangers, trust has become an important driver for its future development [7, 30]. With the growth of individuals around the world joining these services, understanding how to incorporate trust will become essential. More quality and trust metrics will be needed to meet people’s expectations [30]. Also, understanding the motivations that drive people to participate in shared economy services are crucial for their development and for building new ones.

SAS Travelers as familiar strangers: a potential user group for shared mobility services

It can be very common to encounter strangers in our daily visited places whom we may recognize but not formally interact with. This could be a stranger taking the same bus in the morning to university, or somebody who also enjoys spending the Saturday mornings at the same coffee place. The encounters with these familiar strangers may be different depending on many factors, for example the spatial setting [31]. Trip companions are a specific form of familiar strangers, strangers who periodically appear at the same spatial setting for a meaningful amount of time (e.g. bus or bus station) [31]. The amount of time shared in a spatial setting differs depending on trip companions. For instance, SAS travelers may be sharing the same type of transport to the airport, as well as maybe even taking the same flight, and then again choosing the same transport to get to their final destination from the airport. The social interaction between them may be different depending on the prolonged shared setting. If a traveler meets a stranger in more than one part their journey, the intention to interact with this person may increase as they will maybe feel socially connected.

Current services that are bringing together strangers to share rides only consider if their journey itineraries are similar, ignoring if these strangers may potentially share other characteristics that could encourage them to talk with each other and make the journey more pleasant. Research has shown that individuals are inclined to trust those who they may share attitudes and other important characteristics with [27, 29]. SAS travelers could use this type of service to potentially meet new people with the same interests within the community, learn about new destinations and get new contacts around the world. Investigating how social motivation can be used to create incentives for sharing rides between familiar strangers is a primary aim of this paper, since it could open up new spaces that shared mobility services could explore in order to tackle their current participation problems.

METHOD

A Research through Design (RtD) approach was used in this project. RtD is an approach whereby design activities play a formative role in the generation of knowledge, by understanding the current state and then suggesting an improved future state in the form of a design [32]. I used this approach to explore the considerations that needed to be thought-out when creating a service for SAS travelers to share rides from and to the airport. It’s important to point out that the solution was not set from the beginning. I used the design activities to open up a design space and explore different solutions. Prior to presenting their outcomes, a description of all the phases performed including each design activity, will be presented.

Phase 1: Interviews

Semi-structured methods, such as in-depth interviews are appropriate for collecting data on individuals’ personal histories, perspectives, and experiences, particularly when sensitive topics are being explored [22]. I interviewed 20 SAS travelers in order to gain insights on their motivation behind transport choices and from the airport, how those differ between their city of residence and when traveling to a new destination, as well as understanding the motivation that would drive them to share a ride with SAS travelers to and from the airport. Figure 1 shows participants’ demographics.

The interviews were performed in Arlanda airport and during SAS flights to and from Stockholm. The language I used was Swedish, afterwards all the transcripts were translated to English. I analyzed the interviews by searching for patterns, comparing them and later classifying them in themes. One example of a theme included thoughts towards other SAS travelers. The analysis helped me recognize the pain points that SAS travelers face when getting to and from the airport, which allowed me to identify what type of potential users could benefit from such a service.

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Figure 1. List of participants from the interviews and their demographics.
Phase 2: Ideation workshops
After identifying that sharing rides could help benefit SAS travelers to get to and from the airport, it was important to explore how such a service should be designed. From my social circles, I recruited four project managers working at a software company in Berlin, Germany (two men and two women). The aim was to identify different design directions for the service. I divided the participants into two groups and performed an ideation workshop in English with each group at their office in Berlin. Both workshops followed the same structure. In the beginning, a short brainstorming exercise was held to open a creative space. It consisted in coming up with ideas and writing them down on post-its, about how different services involving communities could empower their users to share rides together. Afterwards, the discussion was moved to brainstorm how SAS could bring their community to share the journey to and from the airport. When that was complete, all participants were instructed to make several sketches showing how their possible solutions should be designed to meet the requirements of potential user groups. After the discussion and comparison of sketches, three important design directions were identified in all of the sketches.

Phase 3: Prototyping of mockups
By considering the related work, interviews and the three design directions identified during the workshops, diverse mockups representing several concepts were developed using Adobe XD CC.

Phase 4: Feedback session 1
The mockups were tested during feedback sessions with 10 SAS travelers in Arlanda airport and during flights to and from Stockholm. This was done in order for them to comment if the design presented was understood, point out the features that could be unclear, and identify the optimal design solution.

Phase 5: Final prototype
After considering the comments from the feedback session 1, a digital prototype was made using Adobe XD CC including the final design directions and following SAS design guidelines in order to make it look authentic.

Phase 6: Feedback session 2
The final digital prototype was presented to 5 SAS travelers who interacted with it and provided additional feedback. The feedback session was performed in Arlanda airport, Stockholm.

RESULTS
In this section, I present the results from all the phases during the design process that guided the design decisions in the final prototype (Fig. 2). First, I present potential use cases that were identified in the interviews, followed by mockups illustrating three possible design directions and the feedback concerning them from feedback session 1. At the end, I present the design decisions of the final prototype.

Interviews: Primary pain points that motivate a need for such a service
Even though many potential use cases were identified, here I present the most prominent ones. One frustration some travelers face is living far away from any public transport/transit connection to the airport at their city of residence. Those travelers showed an interest to be able to find other SAS travelers close to their home to share rides with. Participant 3 said during the interview: “I would definitely choose to take the bus to the airport in order to save money and be more environmentally friendly. However, the closest bus station that leaves to the airport is nearly 40 minutes away from home and that is why I end up taking a taxi. Having the option to find a potential ride partner belonging to the SAS community and close to my place would be very convenient”. This service could provide those facing this problem with a cheaper and more environmental option without altering the convenience of their current chosen transportation mode.

Another pain point travelers encountered was that when traveling alone to a new city and arriving at uncomfortable hours, seven out of the twenty interviewees would change their preferred travel mode (public transport) to taxi or shared mobility services like Uber in order to feel more safe and arrive directly to their stay. Participant 5 said “I will always choose the most economic option. However, when traveling alone and arriving late at a new destination, I will most probably take a cab or an Uber. It feels uncomfortable to ride the bus or train alone late at night in an unknown city”. Participant 15 pointed out “It would be great to find another SAS traveler, maybe also a student, to share the bus/train journey with when arriving to a new city late at night”. The service developed could benefit these groups of travelers not only by enabling them to find
others in order to reduce the car costs, but also by connecting them with other SAS travelers that would be interested in sharing other type of vehicles such as buses and trains.

Two interviewees commented that when traveling for business and visiting fairs and conferences in another city, it had happen that they would see other travelers on the same flight staying at the same hotel as them. This potential user group could use the service to share rides with other business travelers heading to the same destination and have the opportunity to make new promising contacts.

Eleven of the twenty travelers interviewed commented that when traveling together with friends or loved ones, they had more incentives to take a taxi from and to the airport at a new city. However, some identified pain points in choosing this transportation. Participant 16 said: “There are many cities where the taxi drivers’ ‘trick’ the tourists and take detours. It would be great to find a traveler that knows the city well to share that ride with and avoid being fooled”. Participant 13 pointed out the benefits of meeting other travelers when visiting cities where there is no information provided at the airport about transit services. She said: “Once, when traveling with my husband to Tenerife and arriving late at night, it was impossible to find out anyone at the airport who could help us to figure out which bus to take to another city in the island. On one of the bus stops we met another couple having the same problem as us. After figuring out together that the next bus was in 2 hours, we decided to share a taxi ride to our common final destination.”. These participants show that it could be beneficial to have a service that enables SAS travelers to share rides with other SAS travelers who maybe speak the language of the country or who are aware of the infrastructure of the city.

Three design directions
The findings from the related work, the interviews and the workshops led me to construct several mockups in each of three design directions that were identified during the ideation workshops. In this section, I provide a description of the mockups developed as well as the analysis of the findings from the feedback session 1.

Temporality of introducing a ride experience
The first design direction that was identified consisted of the temporality factor of introducing a ride experience. The sketches from the workshops showed that there were different ways for SAS to do that. Some of those included doing it via email, at the airport, during the booking process, after the check-in process and during flights. The conclusion of the discussions at the workshops showed that there could be a risk on not reaching out to enough travelers in the community when introducing the service via email, as many don’t open them. Also, when introducing the service at the airport it could possibly lead to many SAS travelers not having time to read about it as many often are in a hurry. Introducing the service during wi-fi on board could be optimal as then all travelers are located in the same place. However, as wi-fi on board is usually not free and/or available at all flights, that option was discarded. The two scenarios that I decided to test were introducing the service during the booking process or after checking-in. One of the reasons behind this decision was that SAS travelers already actively engage with SAS digital platforms during these two times. After deciding this, I designed two mockups, each of them representing one scenario where the opportunity to share a ride was introduced. I did this in order to receive feedback about which of the two cases were more optimal for SAS travelers and to guide the final design.

The findings from the feedback sessions showed that introducing this possibility during the booking process could help the user to start planning their stay earlier, figuring out which transport mode would be necessary to get to and from the airport, as well as having more margin to cancel rides if something comes up between the booking and time of departure. However, travelers felt that it was too early to know if they would like to share a ride, as it was shown that many did plan where to stay after booking the ticket. Other feedback included that the preferred transport of choice to and from the airport could potentially change over time. Overall, the feedback I received from introducing the service after checking-in was more positive. Nine of the ten travelers that participated in the feedback session 1 thought that it was more convenient, as by that time they would already know where they would be staying, weather conditions, as well as traffic reports. Also, travelers commented that when checking-in for a flight one can be certain that the other person will actually be taking the flight. The negative feedback included that when deciding to share a ride after checking-in, one would have less time to cancel if something comes up and less time to get to know the person one will be sharing the ride with.

Creating a ride experience
The second design direction identified in the workshops was creating a ride. It was shown from the sketches that depending on the transportation mode, the way of creating a ride experience would differ. Also, many travelers may not be able to find close rides available to them and being able to create a ride including own preferences was important. Because of this, it was
necessary to identify the features that would be needed for making it possible for all potential users to create a ride that fit all their needs. I designed a mockup representing one way to create a ride, including insights from the interviews. For instance, convenience was recognized to be an important factor when choosing transportation mode to and from the airport. This translated in the design by making it possible for the traveler to decide a radius around their departure place. If the radius is 0, the traveler wanting to join the ride would have to go to that exact address. On the contrary, if the radius is greater than 0, that would mean that the traveler creating the ride is flexible to meet somewhere in that area and depart from a place that fits all people involved.

From phase 1 it was identified that even though SAS travelers are more confident to share rides with others in the community than with strangers, there were a few characteristics that were important for some of them to know about other travelers. The most commented attributes were age, gender and languages SAS travelers speak. It was mostly women who mentioned the importance of knowing the gender of the other person, as they commented that it would make them feel more comfortable to know if the other travelers were also women. The language was important for those who were interested in finding people who spoke the language of the city that they would visit, as well as to be able to socially interact with them during the rides. Age was important as interviewees commented that people belonging to the same age group usually are interested in doing similar things when visiting a city. This led to introducing in the design a possibility to specify preferences about ride partners and hinder travelers who don’t fulfill them from seeing the rides. Also, phase 1 showed, many SAS travelers do not always travel alone. This was translated in the design by allowing them to specify the number of travelers included when creating the ride.

During the feedback session 1, SAS travelers understood the concept presented on how a ride could be created. Even though the participants were not the same as the interviewees, all of them were positive about having age, gender and languages they spoke as available preferences. Some commented that they wouldn’t type in preferences but understood that it could be important for some travelers. One concern regarding the choice to put in preferences was that by doing so, the opportunity to find ride partners would be minimized as one will be excluding other potential rides. Using the radius to restrict the area where the ride should depart was seen positively and convenient by all participants. However, some commented that it can be hard to know how many meters are the appropriate to restrict the area to.

**Joining a ride experience**

The last key design direction identified during the workshops concerned joining a ride. This meant, translating preferences into the design of the service in order to make SAS travelers feel comfortable to join a ride. Phase 1 showed that convenience mattered for SAS travelers when getting to and from the airport. Trustworthiness in the transportation service, mainly when visiting a new city was also mentioned. Two mockups were designed representing two different ways of joining a ride. In the first one, SAS travelers would be presented with a list of all available rides and once an interesting ride was spotted, the traveler could create a profile and ask to join the ride. The idea here was to minimize the process of joining a ride by simply creating a profile when finding a ride to join. A filter feature was added in order to only see rides matching the user’s preferences. In the second mockup, travelers would first create a profile with their details and add preferences before joining a ride. Only after submitting this, a list with available rides matching the preferences would be provided. Both mockup designs included a chat and a profile picture, as phase 1 revealed an interest in being able to talk with the person and see what they look like before riding with them. Both mockups included the sentence “Notify me when rides are available near me” next to an information icon than when clicked would inform the user that SAS could use their address from the booking system to inform them whenever new rides appear close to them.

The feedback session 1 showed that the majority prioritized trustworthiness over convenience. Even though creating a profile after finding the right ride to join can be said to be more convenient, the feedback showed a concern about having available rides public even for those not interested in the service. Also, a bigger worry was that seeing all available rides in the community could make it uncomfortable to reject somebody that may be sitting to the traveler on the plane, especially when the profile picture is showed. Some comments about the possibility to add preferences about ride partners when creating a profile included that it could minimize rides available to join. Regarding the feature of getting notified by SAS when rides are available close to their address was seen negatively by 2 out of the 10 travelers who participated in the feedback session 1. One of them worried that this could lead to receiving a lot of irrelevant emails. Other comments from the feedback session 1 regarded the importance of knowing the number of people joining the ride and the possibility to “close” a ride to not let more people in. In addition, from the feedback I learned the problems luggage could impose. For instance, people traveling with hand luggage would maybe mind waiting
for the ride owner to pick up their checked-in luggage when leaving from an airport. The amount of luggage is also of importance as some transportation modes have limited capacity.

Final Prototype
In this section I describe the design decisions of the final prototype.

Design decisions regarding temporality of introducing a ride experience
The analysis from the feedback session 1 led to the final decision of introducing the service after the check-in process (Fig. 3A). This decision was also guided from a business perspective, since when offering this service during the booking of a ticket it could slow down that process, which could lead to frustration and maybe even reduce bookings. In this case, the service is not disrupting any goal, as by that time, travelers already received their boarding passes and can easily leave the platform when not interested in the service. The requirement of uploading a profile picture was regarded negatively during feedback session 2. The hesitation to participate in the service when this was mandatory, made me change it from “required” to “recommended”. Three out of five travelers from feedback session 2 said that they would consider uploading one later in the process. Having less time to cancel, as well as less time to get to know the person, were some concerns from the feedback session 1. Still, as travelers don’t buy their tickets at the same time, the lack of time to get to know the person would still be a problem.

This problem was dealt instead by making sure to include the necessary features with information about travelers, to give a clear impression of the person they may be sharing the ride with. This translated into the design by having to create a profile before being able to see available rides or create one (Fig. 3B). The contact information includes the name of the person (input as default by SAS), age, gender and languages spoken (Fig. 3B). In addition, the possibility to fill in a personal description was added in order to strengthen the connection between travelers. Users can, for example, specify where they study or what they like when traveling. Travelers from feedback session 2 commented this to be positive as it could help them identify further shared characteristics.

Design decisions regarding creating a ride experience
Figure 4A shows the screen SAS travelers are presented with when wanting to create a ride. Firstly, travelers will have to choose between two options: to the airport or from the airport. Secondly, a field with “ride options” will be presented. Under it, travelers will have to specify transportation mode, departure time, number of travelers, number of pieces of checked-in luggage as well as hand luggage, address and radius. When clicking the dropdown menu next to the type “transport mode”, travelers will not only be presented with a list of transportation modes but also with the name of transit services in that specific city. This was incorporated as it was identified during the feedback session 2 that there is a current problem at some airports lacking information about transit services. For example, when traveling to and from Arlanda airport in Stockholm, the options to choose Flygbussarna7 and Arlanda Express8 will be shown. It will as well show the stopping stations, enabling travelers to specify where they are getting off.

If the number of travelers exceeds “1” when creating the ride, travelers will be presented with a separate window where they will have to specify the characteristics about their companion. Regarding the radius when creating a ride, I added a map specifying the place of departure/arrival and displaying a circle around it that would change in size when adjusting the radius (Fig. 4A). This visual feedback intends to communicate to SAS travelers what these meters imply.

“Preferences about ride partners” is the last field travelers need to fill in before creating the ride. Here, the traveler is able to choose preferences in gender, age and languages spoken. Travelers are able to adjust them later if wanted (Fig. 4B). Furthermore, travelers need to

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7 https://www.flygbussarna.se/
8 https://www.arlandaexpress.com/
specify the number of travelers, checked-in luggage as well as hand luggage that is allowed on the ride. As the feedback session 1 showed an interest about being able to add a comment, I incorporated that feature. This was done as I believe it’s important for travelers to add additional information such as preferred mode of payment or restrictions (such as dog/cat allergies). Figure 4B shows the screen SAS travelers see after creating a ride; when clicking on “change” they will be able to go back and change preferences about ride partners. Travelers are also able to cancel the ride and see the requests received from other travelers to join the ride before accepting those.

*Design decisions regarding joining a ride experience*

Figure 5A shows how to search for rides to join. Screen B shows the overview when the ride owner accepts the request, it includes a chat for SAS travelers to communicate and decide further details.

checked-in luggage and hand luggage. This is done in order to match travelers with rides that have space for that number of travelers and their luggage. Thirdly, when wanted, travelers are allowed to specify preferences in ride partners. They can actively adjust them in order to see additional available rides. This may tackle the concern travelers had about not finding enough rides when restricting the search. After filling in their preferred address of departure or arrival, a list of available rides will be displayed. In addition, travelers can choose to get notified when more rides are available close to that address or choose to create a ride.

Since it was noticed that travelers were worried about having to wait for their ride partner to pick up their checked-in luggage, I decided to add this information in the design. When SAS travelers want to join a ride, the ride description will show if the person creating a ride has checked-in luggage or not (Fig. 5A). Figure 5B gives an overview to SAS travelers about their rides and the possibility to talk with the person that accepted the request as well as be able to cancel the ride.
DISCUSSION
In this paper, I used a RTD approach to investigate the considerations required for creating a service that allows SAS travelers to share rides to and from the airport. The design activities helped understand SAS travelers’ current motivation behind their transportation choices, as well as to recognize primary pain points that motivate a need for such a service. Three design directions were identified and further developed and tested throughout the design process, in order to guide the final design of the service. Below I discuss how the findings from each design directions relate to research and current shared mobility services, and I reflect on the research project more broadly as well as on the method chosen.

Temporality of introducing a ride experience
The number of shared mobility services is growing around the world, as people are downloading applications in order to find, reserve or share a ride. In this paper, rather than creating a new platform, a service is incorporated into SAS’s current application, with its travelers’ community as the target group. As the main goal of using the application is to buy and manage flights, it was important to introduce the service without disrupting the main goals of the user. This is something that established businesses who want to start taking part in the area of shared mobility have to consider. In this case, I incorporated the service after the check-in process to not disrupt the user from other goals. An advantage of incorporating the service here is that the complete trip can be managed in one application, providing SAS travelers with a seamless experience. However, future research needs to be done in order to refine the advantages and disadvantages of introducing an independent application rather than incorporating shared mobility services in established ones.

Creating a ride experience
Research has shown that there are several reasons why people decline to share a trip with strangers. Li et al. [20] mention convenience and personal security as two of the reasons. In this paper, convenience and trustworthiness in transportation services were two factors mentioned by SAS travelers. Scheduling and coordination of routes are some problems affecting the convenience of sharing rides [15]. Dewan and Ahmad [11] describe carpooling as the easiest and most common vehicle sharing arrangement in a private vehicle involving two or more individuals. However, it’s usually the carpooling services the ones deciding the optimal route rather than the users. In addition, current shared mobility services are mostly restricted to one type of vehicle: cars. The results of this paper show that SAS travelers are interested in sharing more transportation modes than just cars and that the motivations change depending on the needs of the user. Offering the possibility to share a ride regardless of transportation modes can open up a new space where users’ incentives to participate may increase. Designing a service where people are not only driven by economic reasons could tackle the personal security concerns that people have regarding sharing rides with strangers. Shifting more control to users and enabling them to create a ride without compromising their convenience is something that existing services and new ones should also consider.

As trust has been identified as an important factor for the future development of shared economy services [7, 30], I decided to focus on this study in a group of familiar strangers who already share common characteristics such as trusting the same airline and sharing the same destination. The interviews showed that SAS travelers would feel more comfortable sharing rides with others in their community than with total strangers. Research has previously shown that people are concerned about attributes such as gender and age when joining ride-sharing services [20]. In this study, it was showed that SAS travelers are also worried about those attributes, in addition to languages other travelers speak. It should however be noted that the majority of participants in this paper were women. Research has shown a need to design with women’s preferences in mind in order to extend the growth of these services, as women have lower acceptance of new transportation technologies [28]. Still, it is important to understand the consequences of designing a service that allows users to discard others based on fixed categories. For example, in this service, problems such as sexism, ageism and racism could arise. Further work needs to be done in order to investigate the implications of choosing preferences and how those problems can be avoided, as well as looking for ways of designing technologies to make women more likely to join shared mobility services.

Joining a ride experience
According to Li et al. [21], ridesharing services hasn’t been as approved as expected. The authors bring up social discomfort and safety concerns as two important barriers when traveling with strangers. Many services that allow users to share rides with each other tackle the problem of social discomfort by including technological solutions, for example, allowing people to rate each other after sharing a ride [26]. In addition, many encourage customers to upload a profile picture. Yet, the aim of uploading a profile picture in this kind of service is to be able to find the ride partner one will be sharing a ride with on the street. In this paper, findings showed that SAS travelers would be interested to see
what the person looks like. However, during the feedback session 2 this was identified as problematic, since when rejecting a ride, the traveler could possibly meet the other person during the flight and this could create social discomfort. In addition, as it was identified during the interviews, many travelers often don’t travel alone. This solution could also be used for people traveling in group who struggle to arrange it into different rides.

**General discussion**

Current businesses have been trying to get people to share rides to and from the airport, still many of these attempts haven’t been successful. One example is Door to Gate⁹, a ridesharing service launched in 2016 with minibuses to and from the airport Arlanda in Stockholm, that had to shut down their services in September 2018. The CEO pointed out that the reasons of the closure were mainly a low flow of transport operations, given that the market reception was not as good as they expected. This lack of success could be a sign that there is no need of such services. Nevertheless, it could also mean that current services do not meet the requirements of travelers or that there is a lack of awareness. Previous research has showed a mismatch between the design intentions of sharing economy providers and the reality for the users of the system [⁵]. Investigating more intensely the market in order to build services that people want to use is key.

This project has shown a new promising way to bring travelers together to share rides, by explaining the considerations to bear in mind when developing such a service. Even though there are social and convenient advantages of restricting the service for only SAS travelers taking the same flight, it should be noted that this could also lead to fewer available rides. Further work needs to be done in order to investigate how SAS could build such a service for connecting travelers flying at a similar time but not necessarily to the same destination. This could potentially maximize the number of available rides. This paper can also serve as inspiration for other businesses like SAS, with a large customer base who share similar travel behavior, to consider ways to connect their community members and enable them to share rides to and from common physical spaces.

**Method discussion**

Conducting a research through design approach helped to continuously guide the design decisions of a prototype for a service to enable people to share rides. Researchers have argued that the results of a R&D method intend to “transform the world from the current state to a preferred state” [⁰]. In this case, the identified considerations can serve as support to make advancements in current shared mobility services or to create new ones. It should be noted that the outcomes of a R&D process are hard to evaluate due to the lack of standards in terms of quality assessment [¹]. In this study, it should also be considered that the majority of participants came from Nordic countries such as Sweden and Norway. Research has shown that sharing is a social process that is often guided by culture [⁶]. Cultural differences may play a big impact on the results of this study, since, for example, Scandinavians may be more stranger averse than people in other countries. In addition, it’s important to consider the age of the interviewees in this paper as the user requirements in carpooling services may be different depending on the age of the user. Research has shown that older participants in carpooling services have “a lower flexibility to adapt the trip time or route to other passengers’ needs” [⁴].

**CONCLUSION**

The aim of this paper was to investigate the considerations needed for creating a service that brings together people with similar travel behavior, so that they can share rides to and from the airport. The results showed that SAS travelers are not only interested in just sharing vehicles such as cars. The service provides them with the opportunity to share the journey with the preferred transportation mode. In addition, this paper shows that by connecting people who already share preferences and interests, the incentives to participate in a ride-sharing service may not only be economical but also social. Therefore, recognizing people’s requirements regarding ride partners and companies could help establish mobility businesses and new ones to understand users’ view around the concept of trust. Also, recognizing the motivations behind their transportation choices, as well as pain points, would help current services and new ones to create more convenient solutions. The considerations presented in this paper are the first steps towards new valuable services that enable people to share rides to and from the airport with others who share similar travel preferences.

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