

Proceedings of 7th Transport Research Arena TRA 2018, April 16-19, 2018, Vienna, Austria

Ticket sharing – a model for a sharing tariff in public transport

Franz Lambrecht a*, Carsten Sommer a

aUniversity of Kassel, Mönchebergstr. 7, 34125 Kassel, Germany

Abstract

About 85% of the daily trips start or end at home. The decision to go by foot, bicycle or car, or to travel by public transport is reached at the residence and depends on the housing situation. Sharing offers for cars and bicycles have proved to be successful in traffic management. However, it doesn't matter yet for public transport. For this reason, so called ticket sharing was developed as a model for a better connection of housing and public transport. Residents from a housing area are provided with transferable season tickets that can be borrowed as required and are shared with all users. The developed ticket sharing model is implemented in a pilot project in the "Lincoln-Siedlung" in Darmstadt (Germany). At first, the specific conditions of the housing area and public transport were investigated. Furthermore, the tenants were interviewed about their attitudes towards public transport as well as their mobility needs. Important factors like pricing, number of required tickets etc. were fixed with the results.

Keywords: sharing; tenant ticket; traffic management; public transport; mobility as a service; ticketing

* Corresponding author. Tel.: +49 561 804-3279; fax: +49 561 804-7382.
E-mail address: franz.lambrecht@uni-kassel.de

1. Introduction

Four out of five daily trips start or end at the own home (Follmer et al. 2010). The daily decision to go by foot, bicycle, public transport or car is reached at the residence and depends on the residential environment and housing situation. Mobility management for housing areas is understood as a method that is developed for residents of specific living quarters or tenants of designated housing companies. They include a specific benefit for the target group in addition to the common services (Bäumer and Köllinger 2009), resulting in a win-win-situation for all participants: the transportation company can create new distribution channels via housing companies. A more reliable planning security and a more reliable financing for the transportation company can be ensured. The resident or tenant receives special offer conditions. The housing association benefits from a customer-friendly image (Bäumer 2015; Dietrich-Wesbuer and Reutter 2003).

Diverse traffic offers such as neighbourhood- related car sharing, services related to bicycle traffic and infrastructure for traffic by foot or availability improvement of public transport stops, should motivate the residents to use alternatives to their own car more often. Despite many good arguments for an expansion, corresponding proposals are only rarely considered in mobility strategies. First of all, housing companies often concentrate on questions concerning the number of parking spaces. Apart from that, the quality assurance and improvement of the main product “home” is the day- to- day business of housing companies. Hence, services far from the main product are treated as subordinate, as long as they do not contribute to the marketability (Bäumer et al. 2015).

Sharing offers for cars and bicycles have proved to be successful in traffic management for housing areas. But it doesn't matter yet for public transport. For this reason, so called ticket sharing was developed as a new model for a tenant ticket (discounted subscriptions for public transport for residents of designated living quarters or tenants of designated housing companies) in the research project “DieMoRheinMain”. It is oriented towards already existing car sharing models. Residents from a housing district are provided with transferable season tickets for public transport that can be borrowed as required and are shared with all users. Further aims were to form the basis for a new general as well as multimodal sharing offer which gives road users the possibility to rent and use each means of transport as required at any time.

This paper describes ticket sharing as a new model for tenant tickets and pricing product for the local public transport. Furthermore it gives guidance for the realisation of ticket sharing based on a pilot project in the “Lincoln-Siedlung” in Darmstadt (Germany). In this pilot project, the specific conditions of the housing area “Lincoln-Siedlung” and the public transport in Darmstadt were investigated. Furthermore, the tenants were interviewed about their attitudes towards public transport as well as their mobility needs. This shows that the current residents see a requirement for ticket sharing. Important factors like pricing, number of required tickets and the access were fixed with the results. This paper doesn't give a feedback and evaluation of the effects of ticket sharing because ticket sharing wasn't implemented completely until 2018.

2. Methods

First of all, detailed research on transport offers for tenants has been carried out. Especially, still existing and past existing offers have been analysed, evaluated and examined concerning the transfer potential. Thereby, especially the success factors and obstacles or reasons for terminating specific offers have been considered. By means of success factors, conditions for implementation and legal requirements, user- specific concepts have been developed and afterwards discussed by participating actors. (Sommer and Lambrecht 2016)

From the results, ticket sharing as a new concept for tenant tickets have been developed. The concept consider different framework conditions for municipalities as well as for residential districts and tenant structures, so that ticket sharing can be established in many regions. For the better use of the potential of ticket sharing and to determine the needs of all participants, a workshop with representatives of housing companies, municipalities, transport providers and tenant associations has been carried out. The concept were presented to the representatives and analysed with regards to practicability. The participants' suggestions were integrated in a general manual.

After that, ticket sharing should be implemented during a pilot project. The city of Darmstadt (Germany) with the new housing area of “Lincoln-Siedlung” was found as a partner. The steps for the development of the offer were discussed with the city of Darmstadt based on the general manual. The situation of the housing area, the connection with public transport and the expected settlement development were analysed.

Finally, a survey of the current residents was developed and carried out. A tariff, the number of required tickets and possible ways of access to the offer were discussed with the actors and developed with regards to the results of the survey. Thereby, ticket sharing can be implemented in the housing area.

3. Tenant Tickets

This chapter describes the previous knowledge about tenant tickets, which is the basis for development and implementation of ticket sharing.

3.1. Definition

Tenant tickets can be understood as a housing-related transport offer for public transport with which tenants of designated housing companies or residents of a particular housing area are able to use reduced season tickets for public transport as a facultative or obligatory offer. The simplest offers (and so far realised the most), especially in the housing stock, are based on the principle of voluntariness (Gogol 2007). The housing company acts as a “Customer Trade Partner” (CTP), purchases the tickets from “Chief Product Officer” (CPO) and gives them out to the “Customer” (tenants in this case) (VDV 2017). Only the CTP holds the contract with the customer. The CPO is the person who is responsible for tariffs. The following guidance is also important for the implementation of ticket sharing (e. g. ch. 5).

3.2. Concepts for tenant tickets

The following scenarios for tenant tickets still exist and were implemented with varied success (e.g. implementation examples): the voluntary tenant ticket and the solidarity tenant ticket. (e.g. Sommer and Lambrecht 2016)

3.2.1. Voluntary tenant ticket

The voluntary model is based on the principle of major customer discounts: The housing company acts as a Customer Trade Partner and buys a larger quantity of tickets from the chief product officer at wholesale prices and passes them over to its tenants. Any interested tenant can apply for the discounted tenant ticket at the CTP. Thereby, discounts from 10-15 % of the standard prices are possible; in case of larger user numbers, they can be even higher. The voluntary tenant ticket primarily advertises frequent users of public transport who do not receive discounts, or occasional users for whom the purchase of a monthly or annual ticket at the normal price is financially not viable. The advantages of the offer depend on a minimum purchase of tickets. Therefore, this offer is not suitable for individual landlords or very small housing companies with a small number of flats. (Sommer and Lambrecht 2016)

3.2.2. Solidary tenant ticket

For a determined group of tenants or households, the solidary model includes an obligatory purchase of tickets. These regularly include a mixed calculation between frequent and spare users of public transport. Because of that, a high discount can be achieved but depends on the number of purchased tickets (compare, for example, student tickets). The costs of the tenant ticket should be charged with the monthly rent. The ticket is only implementable for new building projects or completely neighbourhood- related new letting and could not be inserted into existing rental agreements. (Sommer and Lambrecht 2016)

3.3. Effects

The establishment of tenant ticket offers may result in a win- win- win situation for all participants (Dietrich-Wesbuer and Reutter 2003; Gogol 2007): The tenant benefits from cheaper public transport tickets and a bigger choice of transport mode. Furthermore, he gets better access to public transport. Concerning the residential environment, potentials of general traffic reduction and economy of parking facilities may arise. Housing companies may upgrade their main product “home”. The same applies to transport companies. They also make their product more attractive so that they can gain new customers, bind existing customers for the better and longer and build up new distribution structures. Additionally, the transport company can calculate with a fixed income.

3.4. Implementation

The implementation of transport offers for tenants requires an intensive cooperation among all partners. Already realised transport offers for tenants have shown that single measures need time to be accepted by residents (Bäumer

et al. 2015). For this reason, a constant support and supply of information to potential users is of high importance. Not all activities can be organised by one participant alone. The commitment of tenants is also contributing to the success. The offers should be regularly adapted to the tenants' needs. This happens through a close cooperation with the tenants. The required learning process should not be underestimated. (Sommer and Lambrecht 2016)

3.5. Examples of Implementation

In Bielefeld (Germany), a tenant ticket was established as a pilot project by "Bielefelder Gemeinnützige Wohnungsbaugesellschaft" and "freie Scholle" (two non-profit housing associations of Bielefeld) in cooperation with "moBiel" (transport company of Bielefeld). The ticket is available at all price levels. They relate to the key account offer of moBiel, which provides a 10 % discount for a minimum purchase of 100 tickets (Gogol 2007). Since 2003, a similar tenant ticket has already been offered by "VBW Bauen und Wohnen" (local housing association) to its tenants in Bochum (Germany). This is a key account subscription of VBW which offers tickets to its tenants with a discount of 11.5% (annual ticket, all price levels). Each member of a household can receive a non-transferable ticket straight from the transportation company. Despite the cost advantages, the offer needs to be advertised intensively. In 2013, 1250 tenants were using this offer (Bäumer and Stiewe 2013; VBW 2015).

4. Ticket sharing

Ticket sharing is oriented towards existing car sharing models. Determined user groups (e.g. residents from a district or residents from a single housing unit) are provided with transferable season tickets for public transport that can be borrowed as required and are shared with all users. The access is limited to the residents of the house or living quarter and functions with a box inside or near the home. With ticket sharing price advantages of a discounted season ticket, they can also be used for occasional journeys and thus, costs can be saved. The asset costs are divided among all users through the shared use. Ticket sharing is primarily advertised to infrequent- or non-users of public transport. The success of ticket sharing doesn't depend on a minimum purchase of tickets, because of that it is suitable for small living quarters and single homes. It is easily realisable.

4.1. Attributes

The access is limited to the residents from a residential district. The ticket sharing model first of all addresses non-users and infrequent users of public transport. It has – like car sharing – hardly any advantages for frequent users of public transport, because purchasing an ordinary season ticket is more profitable for them. Ticket sharing will be attractive for tenants if there is a high ticket availability. Through sharing, the acquisition costs are distributed among all users. The advantages of the offer are not dependent on the ticket number or a minimum purchase of tickets. Therefore, this model is especially suitable for a mixed tenant structure and for a single residential building. It is relatively easy to realise, both for existing and new letting. The establishment and operation of this ticket model can possibly be realized without participation of municipalities and transport companies. A ticket sharing offer is particularly suitable for housing areas that are well integrated in public transport. In cooperation with local transportation companies, not only the public transport service (through frequent service, buses etc.), but also the accessibility and future quality of stops in housing areas can be improved. Apart from that, an easy way of purchasing tenant tickets is essential, as well as reliable information about the functionality.

4.2. Legal aspects

Considering legal aspects, there are only few obstacles for implementing ticket sharing. It should be guaranteed a non-discriminatory, exclusive access for all tenants of the participating houses. Apart from that, there has to be a transferable season ticket within the already existing variety of tickets and the transport conditions mustn't exclude a resale or separate accounting. Otherwise, it will be necessary to find a solution with the Chief Product Officer. Data protection must be assured. Only required data shall be collected from the Customer Trade Partner. The data don't have to be contracted out to operate the ticket sharing.

4.3. Functionality

First, it is necessary to create access for participants of ticket sharing. The users have to register with the Customer Trade Partner (similar to car sharing). It has to be assured that only the participating users have access to the tickets. This can be realized with a key box (Fig. 1) and a personalized access card, for example. In the key box, the tickets are contained in separate boxes which can be opened with the access card. The user can keep the ticket and put it back after his return. The ticket can be taken again by another user now. The software recognises the

user and saves the data of the ticket removal and the refund as well as the time of rent and then calculates the costs. After a fixed period (e.g. one month), the user receives a bill from the CTP about all his rents. One or more boxes (if necessary) shall be placed at points with good access, e.g. at the building entrance or near a bus or tram stop.



Fig. 1 Example for a key box (Rau 2016).

4.4. Implementation

A standardised approach for the implementation of ticket sharing does not exist. Due to very different circumstances in cities and quarters, it is barely possible. If a participant would like to offer such a product, following aspects need to be examined and processed:

- The initiator shall ask the residents about their mobility needs and their openness to ticket sharing.
- The initiator has to evaluate the possible number of participants.
- The initiator must identify the right contact person for tariffs.
- The existing ticket offers, including special conditions for pupils, students, seniors and major customers, as well as related services need to be examined.
- Selection of a ticket suitable to give it out to the tenants; as far as it is negotiable, additional services like transferability or the possibility for bicycle transport, can be arranged.
- Signing of a cooperation contract between Customer Trade Partner and Chief Product Officer.
- The CTP needs to install a key box that regulates the access, the lending and the registration of the user.
- An appropriate number of transferable tickets needs to be purchased by the CTP depending on the expected ticket use and number of participating households.
- When setting the tariff for the tenants, it is important that the price for permanent use is fixed unattractively high to prevent malpractice. Furthermore, the price per journey should be lower than single ticket prices.
- Specific communication measures to all addressed households that present the new product and its advantages. Additionally, an application form should be included.

A minimum number of participating households per building is necessary to guarantee a refinancing for the CTP or to be viable for the tenants. Considering profitability, a minimum number of participants per building is irrelevant for housing associations with a higher number of participating residential buildings.

4.5. Combined Offers

Accompanying measures and the embedding into a traffic concept are not necessary for the success of ticket sharing, but can contribute to a mutual increase of attractiveness in combination with the tenant ticket. In particular, special conditions (e.g. decree of the application fee) regarding the accompanying measures can be offered to holders of tenant tickets. Neighbourhood- related car sharing can be seen as substantial accompanying measure: The housing association provides the car sharing company with parking space while the latter cares for exclusive access and special offer conditions for the tenants. When embedding a measure into the traffic concept, the municipalities need to be involved into the planning process as early as possible, because they have to create a possible reduction of parking spaces. As a result, financial resources for creating parking spaces can be saved and passed over to the tenants via special offers. Another possible accompanying measure could be a station- bound bike rental system with e- bikes that is set up exclusively and only accessible for the residents of participating

quarters. It is also possible to create a multimodal sharing offer with Neighbourhood- related station- bound car sharing and bike sharing. The access and rent can be organized with one mobility card for all sharing offers. In this case, all providers have to cooperate with the Customer Trade Partner. The tenants get one bill from the CTP. The service companies settle up with the CTP.

5. Workshop with participants

For the better use of the potential of ticket sharing and to determine the needs of all participants, all actors involved in housing industry, municipalities, transport providers and tenant associations from the RheinMain region were invited to a half-day workshop where information, opinions and ideas were exchanged. 36 participants of all groups of players from the RheinMain region accepted the invitation:

At first, the developed ticket sharing concept was presented to the participants and questions were answered. After that, the presented concept was further discussed:

- Is the presented concept of ticket sharing practicable?
- Which benefit can be achieved?
- Which procedures and regulations have to be attended to?
- Who can assume which tasks?
- Does the business model work?

As a main result, it was stated that the role of each participant has to be defined in detail as well as the guidance which should give an exact distribution and description of all assignments. The participant initiating the process assumes a coordinating function. Furthermore the advantages of ticket sharing have to be as clear as possible because it is not a well know product to the participants and otherwise will cause additional personnel costs. That is why, an initial financing is necessary to implement the offer. The establishment of a foundation or a local initiative for the project is a possible solution for this problem. Furthermore, the participants of the workshop give further advice and show their concern about ticket sharing:

- Ticket sharing has the best prospect of all tenant ticket models.
- The housing company thinks critically about their role as Customer Trade Partner.
- The municipality can also take the role of Customer Trade Partner instead of the housing company.
- Virtual access should be implemented instead of a key box in order to reduce costs.
- The additional personnel costs have to be minimized for a long-run operation of ticket sharing.

The results and advice of the workshop were implemented in the instructions for the ticket sharing concept and were adapted during the implementation of ticket sharing as a pilot project.

6. Implementation of ticket sharing as a pilot project

The developed concept of ticket sharing will be implemented in the “Lincoln-Siedlung” in Darmstadt as a pilot project. In the following paragraphs the implementation steps will be described.

6.1. Lincoln-Siedlung

The selected housing area for the implementation is a new building area in the south of Darmstadt (Germany). The area is a former military area. 3,000 inhabitants shall live there after the transformation will be completed (Fig. 2). The Lincoln-Siedlung wants to become a housing area with a mixed population: there will be apartments for students, families, elderly people but also singles. The student apartments will be located in the north of the living area, the apartments for other groups of people in the middle and the south (Fig. 3). Taking into account the inhabitants' needs and wishes, a traffic concept for the living area will be made. The fact that ticket sharing will be implemented within a traffic concept, is advantageous for the whole process. There is a good connection to public transport with three existing tram lines and one bus line (directly bound for city centre and main station) via a new tram stop. The Lincoln-Siedlung was chosen for the implementation of the pilot project due to the characteristics of the living area, the mixed population and the municipality's interest for the concept of ticket sharing.



Fig. 2 Building construction in progress of the Lincoln-Siedlung in 2017



Fig. 3 Location of the Lincoln-Siedlung in the south of Darmstadt (Germany) with new tram stop (H-sign).

6.2. First steps

In a first step, the concept of ticket sharing was presented and offered to the municipality who wants to support the research and to implement ticket sharing in the Lincoln-Siedlung. There were conversations about the situation in the living area (state of construction, traffic concept, diversification of the inhabitants, connection to public transport, legal aspects and so on) as well as the financing of the required infrastructure.

A new tram stop, directly located at the east entrance of the Lincoln-Siedlung was built and opened in 2017. The traffic concept contains a station-bound e-carsharing, two stations for Bikesharing and a cargo bicycle (mein-lincoln-mobil) as well as a centre for a mobility consulting of the residents. The Ticket sharing shall include the local public transport into this traffic concept.

After all, it could be stated that only 108 apartments were occupied then. The student apartments were also occupied, but this group wasn't considered for the ticket sharing because they have an obligatory student ticket for public transport. Furthermore, it will take some more years until the Lincoln-Siedlung will finally be completed and fully occupied. However, this makes the implementation of ticket sharing even more attractive; the number of purchased tickets is variable due to the flexibility of ticket sharing and can also be changed every month. It is possible to start with a small number of users and establish an increasing number of users and tickets sold over the years.

Another important question was the access to the tickets. Although a car sharing offer already exists, the access to the cars can't be used for ticket sharing. Because of that, it was necessary to create a new access. The solution in consultation with the city of Darmstadt was a ticket box with an exclusive access for the participants by an access card. Due to the small number of occupied apartments, the decision was to create up to three ticket boxes

for all users at first and place them at central locations near the entrance of different houses. The indirect way from the home to the tram stop via the ticket box must be held in short.

Legal aspects were also clarified. The transport conditions of the Rhein-Main-Verkehrsverbund (RMV), the Chief Product Officer for the area Lincoln-Siedlung, allows a resale of the transferable season tickets. There were also conversations with the RMV and the HEAG mobilo (Transport company in Darmstadt) about the ticket sharing.

The last important point was to find a ticket for the sharing offer. The RMV offers different season tickets: annual tickets, monthly passes, weekly passes and day tickets. The annual ticket is offered as a transferable e-ticket with a smart card. It can be bought at any time and cancelled before the end of its validity. In the latter case, the arrearage is refunded for a small fee. The Customer Trade Partner decided to choose this ticket because of the flexibility and the smallest price in comparison to the other tickets. The area of the city of Darmstadt was chosen as a fare zone as the target group consists of users with a shorter travel time and destinations inside the city of Darmstadt.

6.3. Information event for residents

Informing the residents about the new offer is a very important step to create acceptance. Within an information event about the traffic concept, the inhabitants were informed about the planned ticket sharing. They learned something about ticket sharing and the possibility for an implementation in the Lincoln-Siedlung. They could also ask questions and express their wishes for the configuration.

The following important results could be concluded from the information event:

- The residents see a need for ticket sharing, but the parking situation is currently more important.
- A reduction of parking space in combination with collective parking in the “Lincoln-Siedlung” would be accepted by the residents, but they would like possibilities for loading and unloading in front of their homes.
- Cheaper access to public transport has the highest importance for implementation of prospective traffic actions in this housing area.
- The most important requirements of ticket sharing are: wide availability of the ticket; easy access without a complicated registration process; a low fare and an easily understandable tariff.
- The skepticism about the new offer is very high.
- A lot of the participants would try out ticket sharing if there was a special opening fee or a free possibility to test the offer.

As a consequence, these points absolutely have to be kept in mind so that the residents will actually use the offer of ticket sharing. All questions and wishes of the residents were registered and the advantages of ticket sharing were marked. Furthermore, they were informed about a later survey about their traffic behaviour.

6.4. Survey about traffic behaviour

Within a survey, the residents were asked about their traffic behaviour. The aim of this survey wasn't a universal overview about the behaviour of residents. The main objective was to find out the number of potential users of ticket sharing in the “Lincoln-Siedlung” as well as the number of their rides with public transport and the daily time of ride. With the results, estimations could be made as to whether or not ticket sharing should be implemented and the possible number of required tickets.

In a questionnaire, information about the means of transport available to the residents, their attitude to public transport and already existing season tickets, quantity of trips and trip purpose as well as the means of transport they frequently use, were gathered. 27 of the 108 occupied households replied to the survey. Eight of the 27 participants are in the target group (consisted of non-users and infrequent users of public transport who don't have a season ticket, but are open to use the public transport; they make a maximum of 1-3 trips with public transport per week). The data of these participants were further observed. Special attention was paid to the participants' leisure and purchasing behaviour, as well as their visits to the doctor and other occasional journeys. For these activities it is important when they use which means of transport during which time period. However, within the survey of the Lincoln-Siedlung, the quality of data was unsatisfying because a lot of participants didn't fill out all important fields. As a consequence, there was a lack of information concerning daily trips. But there was a tendency to three time periods in which public transport is used by the residents: 10-12 o'clock (mostly purchasing

daily goods), 14-16 o'clock (mostly for chaperoning children) and 18-22 o'clock (sports, going out and purchasing daily goods). Furthermore, there was a potential use of this target group for about 30-35 journeys per month with the possibility for using ticket sharing.

With the results from this survey and the information event, the city of Darmstadt and HEAG mobilo decided to implement ticket sharing in the Lincoln Siedlung in 2018. The next step will be finding a tariff for the users based on the number of required tickets and the potential number of rides per month.

6.5. Tariff

The tariff must refinance the acquisition costs of the tickets and is added to the total number of (potential) journeys as well as the number of parallel use. Furthermore, the tariff must be cheaper than a single fare ticket or the common costs for the whole journey.

There are two possible systems for a tariff: either an equal allocation among all users or a usage-dependent tariff. A usage-dependent tariff including a time component was chosen for the Lincoln-Siedlung. This has two advantages. First, it is a fair tariff that is paid as it is used. Finally, it avoids that some users treasure up the ticket while others cannot use it.

The chosen tariff amounts to one Euro per hour (or 50 cents per 30 minutes). This makes it easy to understand for users and comparable with existing bike sharing offers (e.g. KONRAD Kassel). This tariff was also developed under influence of the current fares in Darmstadt. That makes sure that short trips are cheaper than single fare tickets (2.60 Euros) while long trips lasting a whole day (and treasure up with that) are more expensive than single fare or day tickets (5.05 Euros) and thus unattractive (Fig. 4). But because of that it is also unattractive to use ticket sharing for the trip to work. But that is intentional because the users are supposed to share the tickets so that two or more users can take one ticket on the same day. The fare is added to single and daily fare tickets as well as the local price for a season ticket (56.35 Euros per month) and a median use of one ticket per day. With choosing this tariff, the fare will reach the price of a single fare ticket after 2 ½ hours and the price of a day ticket after five hours. For holidays and on Sundays, the residents get a half price offer (50 cents per hour) to make ticket sharing attractive for excursions. It is also possible to give another person a ride together with one ticket during holidays, Sundays (all-day) and weekdays (after 7pm).

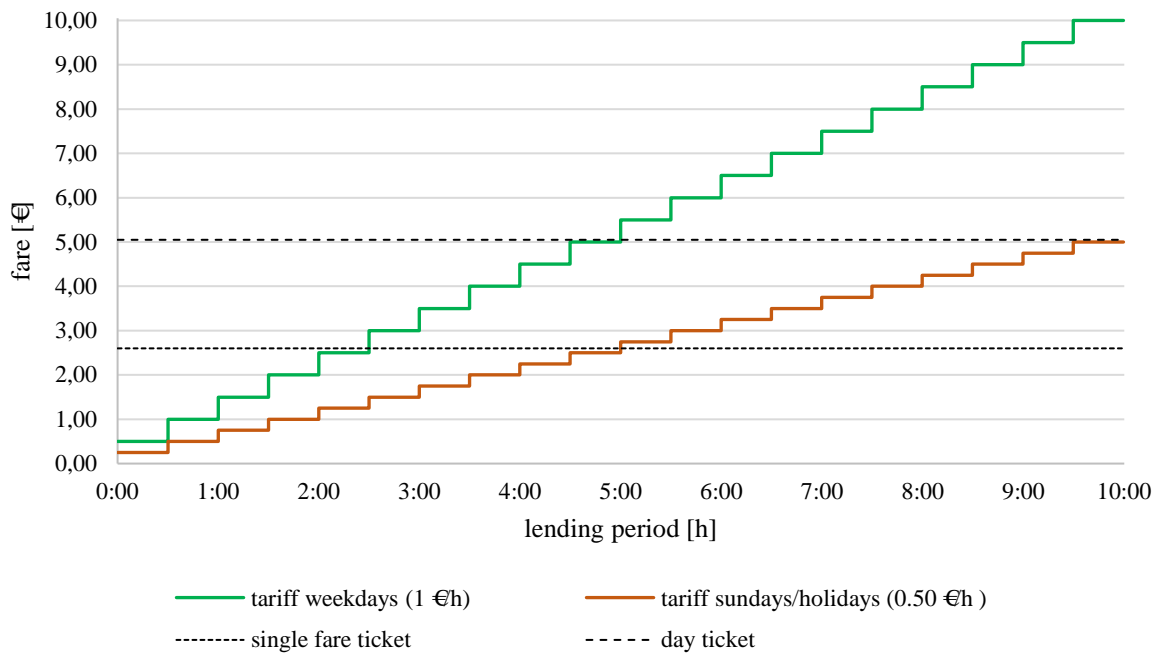


Fig. 4 Tariff of the ticket sharing in the Lincoln-Siedlung (Darmstadt/Germany)

6.6. Financing

For the first implementation, the purchase and setting up of the key boxes have to be financed as well as the organisation of the billing of the users. The city of Darmstadt will take responsibility for all costs for implementation, the operation as Customer Trade Partner and receives the fees from the users. The goal is to fully refinance future running costs, which can be achieved with a good utilisation of the tickets.

7. Further Steps

Ticket sharing as a possibility to connect housing and public transport can reinforce the environmental-friendly means of transport. But it has to be developed further to become a successful and established offer.

7.1. Evaluation

In a first step, the ticket sharing in the pilot project has to be evaluated to find out the real effects of the offer, like a change of modal split or acceptance in the population. That can be reached by conducting a poll with the tenants and by giving an overview of the data of the Customer Trade Partner (e.g. number of lendings). However the offer needs time to become established and to create good results. Furthermore it shall implement and evaluate further ticket sharing offers in other living areas and compare these results. A detailed evaluation is planned after the successful implementation of ticket sharing in the “Lincoln-Siedlung”.

7.2. Multimodal sharing

Ticket sharing can be combined with other sharing systems because of its characteristics. There are advantages in the case of existing car sharing or bike sharing offers, because ticket sharing can be included in these offers. In this connection, the infrastructure (key boxes) of the car sharing provider can be used jointly. But in this case the circumstances of the existing offer must be considered. In a new building area, it is possible to create a multimodal sharing offer from the start which can be well-coordinated. All participants can save costs with one access and one mobility card for all offers.

Acknowledgements

This research was funded by the German Federal Ministry of Education and Research.

8. References

- Bäumer, D., 2015. Preiswerte ÖPNV-Tickets für Mieter und Bewohner bestimmter Quartiere oder Wohnungsbestände. http://add-home.eu/docs/ILS_ticket_for_tenants_guidelines_DE.pdf, Accessed Mar. 13, 2015.
- Bäumer, D. et.al. Mobility meets housing. http://add-home.eu/docs/ADDDHOME_brochure_mobility_meets_housing_germany_final.pdf. Accessed Mar. 16, 2015
- Bäumer, D., Köllinger, C., 2009. Einführung – Das Projekt Add-Home, Wohnstandortbezogenes Mobilitätsmanagement – Projektdokumentation des EU-Projektes Add Home. ILS – Research Institute for Regional and Urban Development, Dortmund.
- Bäumer, D., Stiewe, M., 2013. Klimaverträglich mobil in Zeichen des demografischen Wandels – wie wohnen Mobilität bestimmt. Proceedings REAL CORP 2013, pp. 475-484.
- BGB. German Civil Code. Version of January 2nd 2002, last amended on July 20th 2017.
- Dittrich-Wesbuer, A., Reutter, U., 2003. Von der Idee zur Umsetzung – Erfolgsfaktoren siedlungsbezogener Mobilitätsdienstleistungen. In Mieterticket & Co. – Erfolgsfaktoren siedlungsbezogener Mobilitätsdienstleistungen, Dortmund, pp. 8–14.
- Follmer, R. et al., 2010. Mobilität in Deutschland 2008: Ergebnisbericht. Federal Ministry of Transport, Building and Urban Development, Bonn & Berlin.
- Gogol, A., 2007. Evaluation zielgruppenspezifischer Mobilitätsdienstleistungen von Wohnungsunternehmen. ILS –Research Institute for Regional and Urban Development. Dortmund.
- Lincoln-Siedlung, 2017. Lage und Anbindung. <http://www.lincoln-siedlung.de>. Accessed Jul 28, 2017
- Rau, O., 2016. Wohnungswirtschaft und Carsharing – eine gelungene Kombination in München. https://carsharing.de/sites/default/files/uploads/arbeitschwerpunkte/pdf/presentation_olaf_rau_stattautomuenchen.pdf. Accessed Apr 08, 2016
- Sommer, C., Lambrecht, F., 2016. Concepts for tenant tickets for connecting habitation and transport. Transportation Research Procedia, No. 19, pp. 40-48. <https://doi.org/10.1016/j.trpro.2016.12.066>
- VBW, 2015. The tenant ticket of the VBW Bauen und Wohnen in Bochum. <http://www.vbw-bochum.de/service/rund-ums-wohnen>. Accessed Nov. 13, 2015
- VDV ETS, 2010. VDV-Kernapplikation elektronisches Fahrgeldmanagement – Rollenmodell. https://oepnv.eticket-deutschland.de/fileadmin/Daten/Fachpublikationen/KoMi_ErgebnisHandbuch_KA_V_1.0.pdf, Accessed Jul. 28, 2017
- Zurlinden, 2015. Der Sihlbogen in Zürich-Leimbach. http://www.bgzurlinden.ch/projekte/fileadmin/user_upload/Sihlbogen/Medien/Zuerich2_14112013.pdf. Accessed May 06, 2015