



## **Integrated urban e-ticketing for public transport and touristic sites**

### **Background**

This briefing note is based on the STOA project on integrated e-ticketing for public transport and touristic sites, which ran from January to June 2013. It deals with the development of integrated e-ticketing schemes, with available technology options and with the main stakeholders and their roles and interests. For over a decade, integrated ticketing has been on the agenda of EU transport policy. The overarching idea of a multimodal ticketing system is to combine all transport modes on a single ticket. Such systems aim at facilitating the combination of modes and transferring between them by making the ticketing system as easy and attractive as possible. Different stakeholders (above all, public transport operators) have been trying to replace paper-based tickets with electronic media for many years now, and most countries in Europe have implemented or are about to introduce e-ticketing systems – at least in their capitals. Despite some pilot projects, e-ticketing has not been implemented on a wider scale in Europe; cross-border applications are rare. Most systems function only within a relatively small area (local or regional level) and do not necessarily operate across all modes and only few include other non-transport-related payment options. Systems are, in principle, able to cooperate, but currently there is no direct interaction or mutual acceptance. While technologies are already available and ready to meet multi-functional requirements, integrated schemes often do not reach implementation. The implementation of an integrated e-ticketing system is a complex process that requires the synchronised activity of heterogeneous actors. Besides technological characteristics, legal and economic aspects play a decisive role. The results of the project are based on desktop research; existing and emerging e-ticketing schemes have been analysed and relevant reports, studies and surveys reviewed.

### **What is integrated e-ticketing?**

Integrated ticketing means that all modes can be combined on a single ticketing medium. This usually includes that pricing structures and information are correlated between different public transport operators and are valid for all modes within a specified region. E-tickets store information electronically and pursue a multi-service approach. The key benefit for customers is that a number of operators work together and combine their products on a single card. This could include easy access to information on timetables and tariffs. Companies profit from e-ticketing systems because financial transactions are automated and thus revenues secured; furthermore, the collected data provides accurate information on passenger flows, which can be used for planning purposes. The long-term objective is to provide a system that does not require any action of passengers. Present-day check-in/check-out systems require customers to hold their e-ticket in front of a reader to check in when entering a vehicle and, at the end of their journey, customers need to check out again. So-called be-in/be-out systems do not even require passengers to actively register at specific access points, as the system automatically detects and registers the presence of a smart card (or other fare media) in a vehicle. The system calculates the fees automatically; more and more schemes offer 'best price options', depending on trip length, previous journeys or any applicable discounts.

### **What technology options are available today?**

Basically, two forms of e-ticketing media exist:

- Smart cards are the most common e-ticketing technology, not only in transport. The embedded microchip stores, processes and writes data in a secure environment. The card holders' personal details and additional services and applications can be stored on the card, typically on radio-

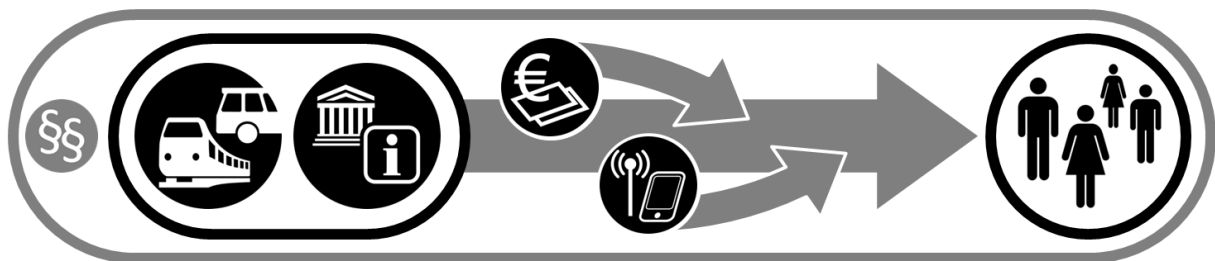
frequency-identification (RFID) or near-field-communication (NFC) chips. Smart card communication with the reader is either contact-based or contactless.

- Mobile ticketing is a service allowing passengers to receive textual or graphical content on their mobile device. Ticket issuers and public transport operators could benefit from reduced production and distribution costs. Compared to smart card technology, initial investments for the e-ticketing infrastructure could be reduced, as the mobile phone acts as a ticket machine. Data is transmitted through the already existing infrastructure of telecommunications operators.

### What drives the different actors to participate in the development of an e-ticketing scheme?

The implementation of an integrated e-ticketing system is a complex process. The integrated ticketing environment comprises different actors, who each have a different role to play and for each of whom drivers or restraints apply in the decision to participate in the process or not. Stakeholders need to agree on technical specifications (e.g., hardware and software compatibility, data management) and on institutional and governance issues (e.g., determine leading institutions, revenue distribution models). The precise nature of a system and the stakeholders involved certainly varies according to the political and economic background and the exact conditions under which a scheme is implemented.

#### Partnership across the integrated ticketing value chain



The most important actors can be categorised as follows:

#### Public transport operators



**Possible role:** Offer a well-established market segment (either existing or new passengers, who will be attracted by the new medium); provide information about tariffs and prices

**Possible benefit:** Increased revenue if passenger levels increase; faster throughput of passengers; reduced operating costs; reduced transaction costs; acquisition of accurate data on passengers

#### Tourism sector



**Possible role:** European cities – as main touristic destinations and major centres of entertainment activities – offer a well-established market segment

**Possible benefit:** Provides innovative branding and marketing opportunities; acquisition of accurate data on tourists' behaviour; additional features possible (e.g., smartphone guided city tours, location-based services)

#### Telecommunications operators



**Possible role:** Provide access to customers' mobile devices; development of NFC applications

**Possible benefit:** Additional services generated by NFC technology might attract and retain customers; potential for additional fees for GSM/UMTS transactions

### Financial service providers



**Possible role:** Develop interoperable application software; access to technical assistance and expertise; issuing and promotion of cards

**Possible benefit:** Pushes forward the general acceptance of e-payment; replace small cash transactions and reduce cash handling costs; potential for additional transactions

### Government and other administrative authorities



**Possible role:** Provide strategic leadership (e.g., provide incentives, encourage use of standards); support the roll-out (e.g., through additional funding); engage in the integration of existing schemes and coordination of stakeholders

**Possible benefit:** Reduction of congestion and car-based emissions if public transport passenger levels rise; providing identity to the community

### Existing and potential end users



**Possible role:** Purchase the product based on their preferences and willingness to take part

**Possible benefit:** Enhanced ease of use, more flexible mode choice and easier interchange; saved time and money

## What is known about the benefits for end users?

The attractiveness of public transport increases as it becomes easier to use. Several studies, surveys and reports point out that there is 'latent' public support for integrated e-ticketing schemes. However, it is often not clearly pointed out who is meant by the end user (frequent public transport users, car drivers, etc.). The most apparent characteristic of 'the end users' is that they are not a homogenous social category. Transport behaviour depends on individual trip purposes (e.g. commuting, leisure, business travel), frequencies (e.g. daily, regular, occasional), travel distances and destinations (e.g. rural or metropolitan). Moreover, habits, attitudes and preferences play a decisive role in transport behaviour – and these depend heavily on the individual contexts. For example, while ease of use and cleanliness seem to have a great impact on tourists' satisfaction with public transport, commuters (especially car drivers) demand for efficiency, reliability and accessibility. Those service attributes are important for sustaining modal shift. Some, but not all of these attributes are addressed directly by integrated e-ticketing schemes. However, technology adoption rates depend not only on the availability and reliability of the technology itself, but also on factors that can vary across different countries or regions. Innovations need to fit into certain social contexts in order to be accepted. These contexts comprise economic, social and cultural factors, as well as lifestyles and epochal mentalities.

## Data security

Using public transport requires a lot of 'inside knowledge', e.g., regarding tariffs and available ticket options. Automatic price calculation could free potential customers from difficult purchase decisions. However, in order to profit from this service, users need to divulge personal information, e.g., about their age, gender, frequency of travel and travel preferences – often without knowing exactly to whom. The collection of personal data is subject to some controversy. On the one hand, the recorded data can be very useful for operators. Data can be used for strategic long-term planning, tactical planning and operational planning. On the other hand, data collection raises major privacy concerns, as multi-application tickets make it possible to create an accurate picture of a person's spending habits and to precisely analyse individuals' travel intentions. It is not clear how potential users will react to tracking technologies and if these would mean a hindrance to implementation.

## Policy conclusion

Experiences with integrated e-ticketing systems prove that implementation requires major efforts, since many stakeholders need to agree on standards, overall purpose and arrangements, on interfaces, designs and on revenue sharing. This is a difficult task in multi-actor contexts. Each of the stakeholders has a different role to play and for each of them, drivers or restraints apply in the decision to participate in the process or not. For a successful implementation it is fundamental to capture these expectations, preferences and priorities in order to understand the diverse interests and possible inter-relations. The development of joint visions could help in structuring and managing these expectations; roadmaps could help to agree collectively on actions. Furthermore, the context of implementation differs across different cities and regions. Geographic, socio-economic and technical preconditions are not necessarily transferrable from one case to the other. A one-size-fits-all solution seems neither desirable nor feasible. Instead, a user interface is needed that is compatible with other applications, but respects local contexts and diversity. Furthermore, user demands are particularly important. As users are not a homogenous group of people, products should be developed that fit to the needs of certain target groups. Not much is known about potential end users, on developing and desired transport patterns and how to best integrate a ticketing scheme into users' lives. Before setting up a ticketing scheme, it should be evaluated whether or not users desire a change and, if so, what it should look like. More research is needed on the effects that integrated ticketing schemes have on modal shift. E-ticketing is just one aspect of high-quality public transport: other attributes must be kept in mind as well.

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