



CiViTAS
Cleaner and better transport in cities



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Innovative ticketing systems for public transport



The CIVITAS Initiative is a European action that supports cities in the implementation of an integrated sustainable, clean and energy efficient transport policy. Lessons learned during the planning, implementation and operation phases of the activities are summarised in twelve Policy Advice Notes and give an idea on how to cope with urban transport problems which cities of the European Union have to face in the future.



Innovative ticketing systems for public transport

Facilitating access to public transport by offering an integrated ticketing and payment system

Within CIVITAS II (2005–2009) different measures were implemented in which innovative ticketing and payment systems for public transport were developed in order to increase the attractiveness of this transport mode and to increase the share of travellers using this mode. Comprehensive information about the implementation processes and results were collected and are summarised in this Policy Advice Note to inform politicians and decision-makers interested in these actions.

Overview

DESCRIPTION OF THE MEASURES

To enhance the use of public transport, cities should aim at making the ticketing system attractive and easy to understand for everyone. The pricing system should be coherent and simple with a reasonable number of tickets that takes users' needs into account. The basis for fares should be transparent and easy to understand. Tickets and payment facilities should be widely available, for example:

- At sales points distributed throughout the city
- At ticket vending machines at various places (e.g. at park and ride stations, at main bus stops or in vehicles)
- On the internet (e.g. subscription for smart card holders)
- Via mobile phones

Integrated ticketing and tariff policies between different public transport operators (e.g. local public transport and the national railway) should be offered to make tickets valid for all public transport modes and for a whole region.





Easy and attractive payment methods should be offered. For example, innovative smart card systems can be implemented, which can be used for contactless payment of integrated fares. They may also serve as an important element of marketing public transport. Smart payments also can provide valuable data on behaviour and mobility patterns of users.

TARGET GROUPS

The main target groups of the measures are current and potential public transport users, but the measures can be targeted at different specific groups, such as schoolchildren, students, families, tourists, visitors etc. Targeting the young can be especially valuable in fostering appropriate mobility habits in later life.

IMPACTS AND BENEFITS

Many potential benefits from public transport ticketing measures were explored during CIVITAS II, and the general findings and impacts are reported here.

For the public

The ease and convenience of purchase afforded by innovative ticketing systems in a city should attract more public transport passengers, resulting in less private cars entering the urban area and greater passenger satisfaction. The accessibility of public transport in general is enhanced with the introduction of a ticket valid for all services and vehicle types.

For individuals

Each public transport user can benefit from a new ticketing system as the new offers are better adapted to the needs and travel patterns of each person. When using a smart card or mobile phone, public transport passengers can

save money because the best price for the trips is calculated automatically (e.g. after a certain amount of trips passengers get a price reduction). If ticket vending machines are provided at bus stops or in vehicles the time for boarding diminishes and the reliability and efficiency of public transport services increases due to the fact that tickets are not bought from the driver. An important issue is also the availability of sales points for different user groups (e.g. elderly people or people with reduced mobility).

For companies

Private companies and their employees can profit by the new systems when sale and subsidy of public transport fares for the employees are simplified. Public transport companies especially benefit from this measure by an increased number of passengers generated by the service. By offering tailor-made tickets for specific users groups new markets could be developed. Additional sources of information about customers are being created, providing valuable data for further analysis for public transport companies.

FRAMEWORK CONDITIONS FOR SUCCESS

The key-factor for success is the development of a user-friendly and simple system. For example, the function of new ticket vending machines should be designed in a self explanatory manner so that no further help is necessary. They should offer a multilingual service for foreign tourists and visitors. For the introduction of a smart card system it is advisable to use a standard architecture, e.g. the ITSO (Integrated Transport Smartcard Organisation). One issue that has to be resolved is the division of ticket income between the different operators (e.g. between rail operator and urban public transport operators).



Implementation steps and timeline

For a successful introduction of new ticketing systems, the following working steps, supporting measures and time-frames have to be considered.

WORKING STEPS

1. Collection of data required

- Investigation of legal requirements (e.g. concession rights, subsidy system, division of fare income etc.)
- Study of the target area (e.g. of the current state of the public transport network, of the existing ticketing system, of the policy on mobility of the city, extension to regional or national rail networks, status of different operators' systems)
- Behavioural survey and market research on customer needs (travel habits, perception of different modes, satisfaction, usage of particular types of tickets, investigation and selection of potential applications for different tickets, etc.)
- State of the art analyses of pricing and ticketing
- Collection of experiences from comparable cities

2. Formal decisions

- Agreements on a joint system between all transport operators, especially on financial contributions from the operators and revenue distribution afterwards
- Discussions whether the participating operators need to pay commission from the beginning of the project or only after a certain running time has taken place

- Approval by the traffic / transport department and/or urban community council on
 - Modification of the pricing system
 - Choice of new technologies depending on the costs and technical complexity
 - Procurement and location of self-service machines and ticket validators
- Partnership agreements on the usage of the smart card for other purposes (entrance to museums, for sport and leisure activities, etc.)

3. Elaboration of the ticketing system

- Definition of prices and designing of the ticket products according to the user needs
- Agreement on the technical aspects of cards, vending machines and ticket validators (considering needs of handicapped people and the availability of different languages)
- Identifying framework conditions for the availability, registration, payment and delivery of tickets
- Agreement on monitoring and management strategies
- Selection of other services to be integrated into the system (e.g. car-sharing, public bikes, parking, etc.)
- Agreement on graphical user interface and software configurations

4. Tendering and negotiation with ticketing suppliers

5. Implementation and installation

- Connecting the central management system for the ticket integration (ticketing server) to the other transport operators management / pricing systems
- Adoption of the software for the internet (e.g. for online subscription of smart cards)
- Production and distribution of the machines (for ticket vending, ticket validators, etc.)



- Establishing a partnership with shopkeepers, hotels, etc. where tickets can be bought
- Training sessions for the control inspectors from the passenger transport unit, the distributors and retailers

6. Promotion of the new services and their advantages

7. Evaluation and monitoring of system

ACCOMPANYING MEASURES TO AMPLIFY POSITIVE EFFECTS

If the following measures are implemented in parallel with the introduction of new ticketing systems, the success of the actions can be enhanced and positive synergy effects can be achieved:

- Offering a wide range of other services to the public transport users and/or smart card holders (e.g. access to car-sharing or bike-sharing, cultural and leisure activities)
- Discounted prices for bike-sharing and/or park and ride schemes in the cities
- Introduction of a travel planner (e.g. on the mobile phone) to find the right route, means of access, and to order the ticket for this route at the same time
- Installation of security monitoring systems (e.g. cameras), which can protect machines from vandalism

TIMEFRAME

The experiences of CIVITAS II provide insight into the typical duration of the planning and implementation phases. All in all the introduction of a new ticketing system requires about two years.

The preparation phase can last up to 16 months (design study, elaboration of the system, formal decisions, selection of locations, etc.). Within CIVITAS II the following time periods were needed:

- Market research to investigate the needs of the customer takes about two months
- Initiating a study on payment possibilities requires about five months
- About one month is needed for negotiations with public transport operators, but this time depends on the attitude of the stakeholders towards the measures and the number and types of operators involved (e.g. negotiations with a railway operator may require longer period due to different legal regulations)

The implementation phases vary between 2 and 10 months according to the system to be installed. Within CIVITAS II the following time periods were needed:

- 2 to 6 months for the implementation of integrated public transport ticketing products and payment methods
- 8 months for the establishment and adjustment of the equipment for a smart card system (changing the software on the validators; installation of antenna and interface on each vehicle; installation of an antenna on the bus terminal's main building, connection with the ticketing server; ticketing server updating)
- 4 months for the development and adoption of a public transport ticketing system at park and ride sites
- 10 months for the development and adaptation for an internet tool applicable for the subscription of smart cards
- Training sessions for integrated ticket distributors requires about two months



What are the investments involved?

Costs vary greatly according to the type of system implemented, to the number of ticketing machines/validators as well as the number of vehicles to be equipped with new technologies. However, the following costs categories need to be considered:

- Costs for specifying and developing a new ticketing system (consultant, involvement of transport operators, etc.)
- Software for integrated ticketing systems (to connect the systems of different operators, internet tool for subscriptions, user software with an easily understandable interface, etc.)
- Equipment for vehicles, stops and stations (antennae, ticket vending machines, validators, etc.)
- Maintenance costs for the equipment
- Maintenance agreement for software, if proprietary
- Costs for updating the system and the software
- Additional costs (e.g. for the development of a monitoring system)

The following experiences, concerning the level of funding necessary were made within the CIVITAS II measures:

1. EUR 13,000 investment costs for hard- and software for an integrated ticketing system
2. EUR 712,500 for the purchase of 16 ticket vending machines with associated back-office central management system
3. EUR 60,000 maintenance costs per year for 16 ticket vending machines
4. EUR 10,000 spent for marketing, promotion and training activities on a new ticketing system

However, it has to be considered that certain costs can be avoided by introducing the measures. Each transport operator can reduce costs for distributing and selling tickets because all operators use the same tickets and share the same ticketing machines, resulting in more favourable procurement terms. Due to high operational costs a common service provider may take over these tasks. Technical developments of applications for mobile phones or PDAs may lead to a more cost-saving way of ticketing.

Main drivers that serve as precursors to success

Within CIVITAS II the following factors were identified as the main drivers for the initiation as well as for an efficient and successful implementation of the measures described above:

- Price discounting for integrated public transport tickets (as compared to individual tickets)
- Good cooperation with the public transport operators (local, regional and national)
- A strong partnership among various stakeholders interested in encouraging the use of public transport
- Strong political support, e.g. for adapting the ticket system to different user needs
- A good promotional and marketing strategy, tailored to the different target groups
- Clear, comprehensive and accessible information on the new system
- Knowledge exchange with other peer cities using the same or a similar ticketing system providing the opportunity for joint procurement of technical equipment



- Changing government rules to favour the introduction of integrated ticketing schemes
- Opening ticketing to other transport services, including park and ride, bicycle parks, etc.

Strategies for a successful implementation

During the implementation phases different barriers can occur. To overcome obstacles the entire implementation and planning process should be accompanied by regular discussions and working group meetings concerning different issues, such as those described in the following paragraphs.

Political Support

In order to ensure political support, it has to be determined that the majority of the public transport users benefit from a new and transparent system, in particular by improving accessibility or by offering tailor-made tariffs for specific user groups. Politicians' presence should be engaged from the beginning of the planning process to assure sustained support for the measure. They should be familiar with the advantages of implementation of the system, underlining its coherence with strategic, long term-policy documents already adopted (e.g. strategy for city development, transport plan or transport policy).

Acceptance

Support of the transport operators and their acceptance needs to be guaranteed. Consultations and communication are necessary in order to explain the aims and benefits of the new system and to assess the impacts and benefits which occur for all parties involved. A

clear strategy on how to distribute the revenues among the public transport operators has to be agreed to ensure that all parties are benefiting without any net loss of revenues caused by the introduction of an interoperable ticket.

To enhance comprehension, it is important to develop easily understandable systems (e.g. structure and transparency of the tariff system, user-friendly software interfaces, etc.), to communicate and promote the benefits of the offers, as well as to provide informational material on its use.

Financial management

Ensure funding

For the introduction of an integrated ticketing system by different transport operators, it is advantageous that the main transport operator is responsible for the purchase and installation of the equipment, such as the ticket vending machines. In doing so, smooth and rapid introduction is ensured. The most effective solution is to implement the system through the transport authority or transport department which is interested in the wider aspects of mobility in the city and in the participation of the different transport operators.

Ensure the usage of new tickets

Effective promotion and marketing campaigns can ensure that the new offers are used and that a certain level of revenue, due to ticket sales, can be maintained for the operators. This can avoid the subsequent withdrawal by public transport operators due to lack of use.

Limited amount of technical equipment

For medium-sized cities, which usually buy only a limited number of ticket vending machines, ticket validators, etc., it is recommended that other cities interested in the system be identified, if possible. Together a joint procurement can be accomplished and the technical equipment can be purchased for a lower unit price.



Technical aspects

Interoperability

State of the art studies and tests should be implemented to ensure the interoperability of the various technical systems. Additional management support, financial resources and staff assistance as well as an improved risk management should be offered. Furthermore, regular updates of the software and manual checking of the ticketing system have to be undertaken. It is important at the specification stage to set requirements on interoperability and to consider an "open systems" approach, anticipating the possibility of later upgrades and expansion to other modes / operators.

Data security

Much effort has to be deployed to ensure the security of personal data and bank details where tickets can be paid for with cash cards and/or credit cards at ticketing machines and on the internet. Therefore, a redesign of the public transport operators' websites may be necessary.

Maintenance

For adequate maintenance of the technical equipment and services a contractor has to be found with appropriate skills and knowledge.

Legal framework condition

It is important to ensure, from the beginning of the project, that the scheme design complies with national and local legislation. It must be clear that the competition regulations are consistent with the integrated ticketing service when different transport operators are involved. In some countries (e.g. United Kingdom) the law prohibits the formation of transport associations which offer integrated tickets in order to ensure fair competition frameworks.

Organisation

All cities (especially medium-sized cities) which aspire to develop a smart payment system

should be conscious that these initiatives are technically complex and require significant investments in terms of time and money. But if a complex tariff structure is introduced and numerous transport operators are involved, then the systems are efficient tools to address these problems and to make the system more user-friendly. The measures all need a continuous mobilisation of stakeholders and efforts to convince new sales points to take part.

To ensure a clear distribution of responsibilities and to regulate the commitments of the different partners and stakeholders (public transport authorities, public transport operator, car park manager, public bikes manager, etc.) the cooperation and dialogue between these different parties have to be strengthened and supported in meetings organised by the measure leader.

KEY ELEMENTS TO BE CONSIDERED

- The pricing system should be coherent and simple with a reasonable number of tickets that takes the user's specific needs into account
- The decisions on the type of joint system as well as on the division of the financial contributions and the ticket income have to be clarified between the different operators at the beginning of the project
- In order to reduce costs medium sized cities especially should look for other cities with the same interests with which joint procurement can be accomplished and the technical equipment can be purchased at lower unit prices
- State of the art studies and tests should be implemented to ensure the interoperability of the various technical systems



Who are the key people to be involved?

STAKEHOLDERS

The following stakeholder organisations / individuals should be involved as informal advisors or supporters:

- Public transport users participating in meetings and/or contacted by surveys to gain information on their specific needs. Users should be given the possibility to test different tickets, tools and equipment.
- Different specific target groups (students, people with reduced mobility, elderly people, employees etc.) to collect special requirements and needs
- NGOs focusing on sustainable mobility (e.g. green organisations) which might cooperate in promotion activities for this measure
- Public enterprises to contribute to the design, implementation and promotion of the new system as well as to build a strong local partnership
- Associations of hotels, museums as well as other leisure and retail sites contributing to the development of special ticket offers for tourists and visitors
- Local and regional politicians
- The cooperation with providers of the ticketing machines and technical specialists is important for an on-going technical support

MAIN PROJECT PARTNERS

The involvement of the following partners is critical to the successful implementation of the measures:

Decision makers

The leading role for the measure providing policy guidance is generally assumed by the local city administration (e.g. the transport or traffic department). Also the main transport operator or the public transport authority responsible for the entire public transport in the region should manage the measure as project leader. In many countries it is the city council that approves budgetary expenditures for investments in public services, so its role should be considered separately for each country.

Operators

The operators of the ticketing service are the public transport providers.

Financers

The measures are initiated and financed by the local administrations, but the transport operators will be asked to contribute financially to the project in the future and this will require some negotiations. The investment costs could be monitored by an independent organisation, in particular if public money is used the audit court of the country may take over the responsibility.

Other partners

For the execution of the different studies and surveys required (such as databases), universities or similar research institutions can be appointed. Private companies and consultants can support the measure leader in the project management and the technical development of the system. Private enterprises are needed for the service and maintenance of the technical equipment.



Enumeration of practical examples from CIVITAS II

Within CIVITAS II 7 cities implemented measures dealing with introducing new ticketing systems:

Malmö (Sweden): Mobile internet information on services in connection to bus information

Krakow (Poland): Integrated ticketing and tariffs

Toulouse (France): Innovative multimodal public transport contracts, services and electronic ticketing

Norwich (United Kingdom): On-street ticket vending machines

La Rochelle (France): Development of an integrated pricing system, implement further integration of ticketing as well as smart card system

Ploiesti (Romania): Development of a new ticketing system for public transport

Preston (United Kingdom): Implementation of integrated public transport ticketing as well as an integrated transport ticketing system



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The CIVITAS website contains information about CIVITAS-related **news and events**. It provides an overview of all **CIVITAS projects, CIVITAS cities** and maintains **contact details** of over 600 people working within CIVITAS.

In addition, you get in-depth knowledge of **more than 650 innovative showcases** from the CIVITAS demonstration cities.

Visit the CIVITAS website and search for **prime examples of experiences** in sustainable urban transport currently being undertaken in cities. If any of the ideas suit your city, or you are just interested in learning more, you may then contact the relevant person responsible for this measure.



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