



**CiViTAS**

Cleaner and better transport in cities



09

POLICY ADVICE NOTES

# Innovative information 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 information systems for public transport

Facilitate access to public transport by providing reliable information



Schiffer

In order to attract more people to use public transport, new information strategies were implemented in European cities within CIVITAS II (2005–2009). Experience with planning and implementation processes was collected and is summarised in this Policy Advice Note.

## Overview

### DESCRIPTION OF THE MEASURES

A good passenger information strategy helps to ease the access to the public transport network for each person, whether they currently use public transport or not. Correct and reliable real-time information should be available for passengers before and during travelling to enable them to plan door-to-door journeys using the most appropriate departure time and route from the beginning to the end of their journey. Amongst other, the following information can be provided to the passengers:

- Schedules and network maps, which are clear and coherent in terms of space, design and formulation
- Real-time and mode-specific arrival and departure times, timetable changes and detours in traffic and alternative routes (if necessary)
- Information inside the vehicles about the route number, destination, the following stops and possible connections to other public transport lines and modes (on electronic displays and with voice announcements)



- Information about opportunities for inter-modality, such as car-pooling, car-sharing, public bikes, bike and ride as well as park and ride facilities (e.g. information on available parking space at park and ride facilities)
- Additional information enabling calculation of the most sustainable way of travelling

The information should be available at the right moment, at appropriate locations and through the appropriate media:

- Via variable message signs (VMS), on information boards and on loudspeakers at the stops or inside the vehicles (on-trip)
- Via the internet (pre-trip and on-trip)
- At customer service centres (pre-trip)
- In printed brochures (pre-trip and on-trip)
- On touch screens at different locations of the city (pre-trip and on-trip)
- Via the telephone (Interactive Voice Response – IVR, automated or staffed) (pre-trip and on-trip)
- Via mobile phones by using SMS (pre-trip and on-trip)

Information systems can also provide a personalised trip planning tool (e.g. through the internet or via mobile phone giving the customer the opportunity to plan the trip by indicating the origin and destination in a fixed timeframe. Furthermore, information about walking distances when transferring vehicle or transport mode or from a location to the next public transport stop can be provided. Environmental impacts and costs of trips with different transport modes can be offered as well, including the calculation of the cheapest and most sustainable way of travel.

All information should be available in a barrier-free format ensuring that those who are less computer literate, people with special needs, the elderly and visual impaired and deaf persons have access to the information needed.

## TARGET GROUPS

The measures are targeted at public transport users, inhabitants of the city as well as at visitors and tourists. Special attention should be paid also to persons with special needs, such as visually impaired or deaf people.

## IMPACTS AND BENEFITS

### For the public

By improving the information on the public transport system, public transport can develop as a real alternative to private car use. An increased use of public transport can reduce congestion and local climate issues. By providing integrated information intermodality can also be supported. Furthermore, better information results in substantial time savings for current public transport customers because of the possibility of improved planning and intermodality.

### For individuals

Each person using public transport, (or contemplating its use) can benefit from the measure since reliable and real-time information makes journeys more efficient by minimising travel and waiting times and also helps to build confidence. It facilitates access to, and use of the public transport network <sup>1</sup>.

<sup>1</sup> Passenger Information. Core Brief of UITP. UITP, March 2001



### For companies

Public transport companies and public transport authorities achieve a better image when providing real-time information and when using innovative information systems in their communication with the users, resulting in higher customer satisfaction. The possibility of higher income might be a long-term benefit when the measures result in higher demand for public transport. Besides passenger information, these systems can also be used for successful fleet management.

### FRAMEWORK CONDITIONS FOR SUCCESS

It helps if the local institutional framework, as well as the structure of the authorities and their different competencies, fosters the introduction of a shared multimodal information service with multiple stakeholders in order to establish an integrated information system. Exchange of information from different providers needs a clear agreement among all partners involved (Who is providing which information? Who is allowed to use the information? Is the exchange in line with the national data protection law? How are the costs shared?). Finally, an “open systems” approach is recommended to avoid lock in to specific systems and to allow for later system upgrades supplied by other providers.

## Implementation steps and timeline

**When implementing measures that introduce new information systems, the following issues must be taken into account. Introducing supportive measures can enhance effectiveness. It is also vital to identify a realistic schedule for implementation.**

### WORKING STEPS

#### 1. Collecting the information required

- Analyses of the state of the art of available information technologies, organisational structures, stakeholders to be involved and sustainable financing schemes for establishment, operation and maintenance of the measures
- Evaluation of the current status of the information infrastructure of the public transport system and the acceptance rate of its users
- Analysis of specific user needs including analysis of origin destination patterns, the needs of the elderly, the mobility impaired and users with special needs

**2. Especially in relation to the design and implementation of multimodal, multi-operator information systems, it is important to establish a close cooperation and relationship of trust between the partners**

**3. Initiating the formal decisions** required and organising the implementation team





#### **4. Design of the overall system architecture**

- Defining the technical and functional specifications of an integrated information system
- Deciding on the information offered and format
- Selecting locations and media where information should be offered

#### **5. Initiating the call for tender** to appoint specialists for the development and the provision of the new services

#### **6. Development of the information services in detail**

- Definition of the data to be acquired
- Developing the contractual and business model for designers, equipment suppliers, contractors and service providers
- Creating an operational scheme
- Designing the software required
- Defining the design and characteristics of how the data will be provided
- Establishing a marketing campaign
- Defining the monitoring and evaluation strategy

#### **7. Commissioning and testing the system** (on a smaller scale)

#### **8. Installing the system** (on a broader scale)

#### **9. Promotion of the new information services**

#### **10. Evaluation**

- Monitoring the reliability and accuracy of the data provided
- Monitoring the costs and benefits of the installed system and comparison with a base case corresponding to the measure not having been implemented
- Assessment of the customer satisfaction

### **ACCOMPANYING MEASURES TO AMPLIFY POSITIVE EFFECTS**

General information, education and marketing campaigns for clean public transport can also be used to raise awareness concerning the new information services among the residents. Special services should be included for people with reduced mobility (e.g. providing voice information to people from speakers outside of the vehicle, including information about accessible vehicles and bus stops). It is also possible to provide links with employers' intranet sites to give tailored travel information including real-time passenger information.

All measures which generally enhance the quality of public transport in a city in general support the success of new public transport information systems. For example, the introduction of new vehicles will create a synergy effect between new information systems and a general improvement of the public transport system.

Public transport prioritisation – introduction of such a measure, which is parallel to improved access to information, will result in “concrete” advantages for passengers (time savings) and better possibilities to inform them about it.

Furthermore, it should be considered how the public transport information can be blended with other travel information to support public transport as a convenient, safe and clean option for journeys. For example, information about tourist attractions or cultural heritage, shopping facilities and offers, can be tied to clean urban transport and the possibilities of inter-modality.



## TIMEFRAME

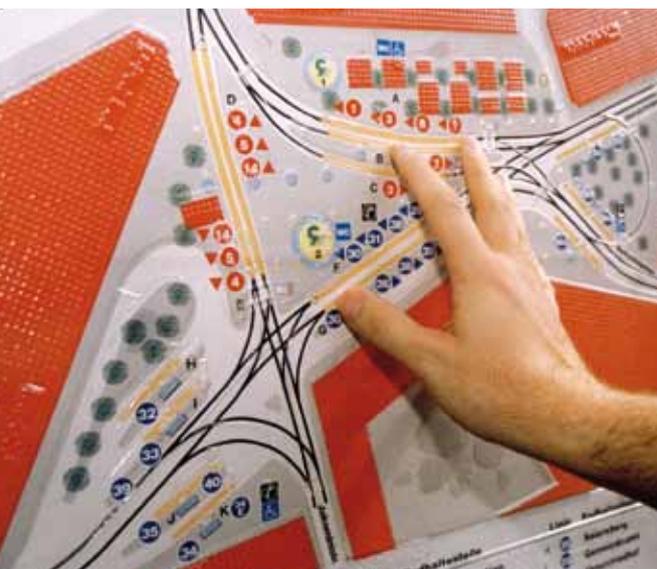
Depending on the kind of information measure and type of media chosen, the implementation phase of the measure varies (in CIVITAS II cities typically between 26 and 48 months).

- The development of an information strategy for the public transport system requires about three months
- The development of internet tools (e.g. a trip-planning module, a tool for the calculation of environmental impacts and travel costs) depends on the scope and complexity of the facility and the quantity of the data to be integrated. Between 7 and 22 months were needed in CIVITAS II cities to create such tools and to integrate them.
- The time needed for the installation of the information signs varied between 5 and 24 months in the CIVITAS II cities, depending on the number and kind of panels. For example, the installation of ten real-time signs at public transport stops took around eight months.

## What are the investments involved?

The following cost categories need to be considered:

- Equipment (hard- and software) and design of websites, internet- and mobile-phone trip planning tools
- Equipment for installation at stops, in stations and vehicles, which inform the users (e.g. signs, touch-screens)
- On-board equipment for buses and trams (e.g. GPS) and a central real-time prognosis server to manage and provide real-time information (hard- and software)
- Installation costs (e.g. installing real time signs, touch-screens, electrical supply to bus stops)
- Operation costs (hardware maintenance, software licence and operation, marketing and communication, costs for operations staff)
- Specific issues for interchanges (depending on the size of the interchange)



Schiffer



In CIVITAS II cities, which introduced new information services, the following costs were incurred during the planning and implementation phases of the measures:

- EUR 8,000 for the purchase of equipment, hard- and software needed for the operation of a new mobility website as the basis for the trip planning module (Krakow, Poland)
- EUR 16,000 subcontracting for the design of a new website, operational and management activities (Krakow, Poland)
- EUR 26,000 for 15 fixed touch-screens, seven information panels and seven parking service panels (Burgos, Spain)
- EUR 55,000 to equip 28 public transport stops with real time information signs (one panel costs around EUR 2,000, but EUR 1,500 to 2,500 investment costs are needed additionally for each stop for the installation of a power supply line and the authorisation for the work) (Ploiesti, Romania)
- EUR 600 per month was needed in Ploiesti (Romania) to supply energy for the 28 panels (60kwh/panel)
- EUR 93,000 for 10 smaller monitors and EUR 186,000 for one large sign (Malmo, Sweden)
- EUR 1,793,500 to equip 426 vehicles of the public transport fleet (buses, trams, trolley-buses) with electronic displays and automatic stop calls (Tallinn, Estonia)

Revenues may be increased, to offset these costs, as more people are attracted to use public transport by an improved and tailored information system.

## Main drivers that serve as precursors to success

**The following factors listed below are the main drivers for the initiation as well as for an efficient and successful implementation of the measures described above:**

- Good cooperation among the members of the project team, particularly in deciding upon the equipment and the information strategy
- Efficient coordination of the involvement of stakeholders
- Support from the highest political level that is convinced of the need for providing better passenger information (e.g. the local administration, city councils)
- Support and pressure from public transport passengers and residents of the city (especially people who use public transport as a single choice for travel)
- Inclusion of the new mobility information website within the official website of the city
- Clear regulations for exchanging information between all providers and users respecting data security, distribution of costs and revenues etc.





## Strategies for a successful implementation

**Although the measures described here are not very controversial, a few recommendations for a successful implementation are listed below.**

### **Political support**

The local technical committee of the project has to explain to politicians the project idea in detail, the implications and how the changes can affect the public transport system in the city. This may be necessary to avoid the politicisation of the topic at a later stage that might provoke a change of the politicians' support.

### **Acceptance**

In order to assure that new services are accepted by the public, the following issues have to be taken into account:

- Public transport information should be understandable and easily accessible, clear and short
- Information should be easily distinguished from other surrounding systems
- Information should be current, correct and accurate
- Information should be adapted to different customer groups and their needs (especially taking into account visually and hearing impaired people)
- An efficient information system should facilitate passengers in planning their journeys from door to door whilst incorporating different forms of transport

### **Financial management**

Adoption of advance information technology requires significant financial investments, which have to be assured from the beginning of the project (e.g. by the regional or municipal transport authority). To assure the economic sustainability of the measure after the implementation, a specific business plan should be designed that includes costs and revenues generated from advertising, internal cost reductions, and sales of specific customised information services, e.g. selling to other travel service providers. It is also recommended to ensure that the original tender includes adequate technical back-up to ensure long term operation of the system.

Often the technical equipment for offering real-time information at each bus shelter of a city is not possible for financial reasons. Therefore, it is reasonable to initially install such equipment at the main transfer stations and important stops. Less important stops can also be covered by mobile phone services.

### **Institution & Organisation**

It is important to develop close cooperation between all partners and stakeholders involved (e.g. public transport operators). Sufficient labour resources need to be planned in order to undertake the often time consuming implementation process.

Private partners often have information that they retain as proprietary, and therefore it needs to be clearly defined which information can be shared and what revenues are foreseen for the vendors. Public partners can have different objectives which have to be adjusted in discussions and negotiations, as the concept of multimodal information instead of uni-modal information is rather new and some of the organisations may have other priorities (e.g. new infrastructure or rolling stock).



Discussions with local architects and administrators responsible for historic conservation may be necessary in order to define the most suitable locations of the information panels and their appropriate design, which needs to be coherent with historical shape of the area affected.

If implementation takes more than one year it is advisable to put the measure into the public transport development / mobility plan to secure financial sources for the longer period.

### **Technical Aspects**

It is essential to have some in-house and/or externally engaged technical knowledge of the solutions to be implemented in order to ensure the appropriate level of technical specification within the tender documentation, subsequent project scheduling and contract management. The same technical solution (hardware and software) should be chosen for all modes. In particular, the integration of existing systems needs to be considered in order to offer an intermodal information service for the whole public transport network.

Existing signs, which are out-of-date and are not in line with the new systems, have to be upgraded or replaced to avoid misunderstanding concerning differing information content. It is recommended that the installation of new information systems is incorporated within a wider transport information strategy.

Tests and studies have to be implemented to determine adequate systems for the data collection. These systems have to work with a high degree of accuracy to predict travel times, because this is a pre-requisite for the whole information chain. Special attention should be paid if data are coming from different content providers.

### **KEY ELEMENTS TO BE CONSIDERED**

- When establishing an information system for public transport, people with reduced mobility can benefit especially from this as the services usually offer special services for them (e.g. voice information from speakers outside of the vehicles)
- To ensure the acceptance of new services by public transport users, the information should be correct and the system has to be easily accessible; it should enable passengers to plan their journeys from door to door
- For financial reasons it is advisable to initially install the new techniques at the main transfer stations and important stops
- It has to be defined clearly which information concerning private partners can be shared and what revenues are foreseen for the vendors

## Who are the key people to be involved?

### **STAKEHOLDERS**

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

- Potential and current public transport users, car drivers, commuters, students and visitors of cities should be involved in focus groups and workshops. In general, they can be supportive for such activities because they are directly influenced by the impacts.





## Enumeration of practical examples from CIVITAS II

**Within CIVITAS II 10 cities implemented measures dealing with new information services in their city:**

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**Burgos (Spain):** Infomobility tools

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**Genoa (Italy):** Intermodal infomobility platform

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**Krakow (Poland):** Intermodal infomobility platform

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**La Rochelle (France):** Real-time information system

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**Malmö (Sweden):** Mobile internet services connecting to bus information; Use of real time applications for journey planning

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**Ploiesti (Romania):** Implementation of a real time information system for public transport

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**Preston (United Kingdom):** Information dissemination

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**Suceava (Romania):** Improved public transport information; Information and awareness rising

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**Tallinn (Estonia):** Automatic stop calls & info sign in bus

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**Toulouse (France):** Development of an integrated multimodal traveller information system

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www.civitas.eu

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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