Basic technologies for use in the detection of passengers (VSS2009/903)

Basistechnologien für die intermodale Nutzungserfassung im Personenverkehr

Funding: National (Switzerland)
Duration: May 2010 - Oct 2011
Status: Complete with results

Background & policy context:

Electronic data capture and tracking in public passenger transportation is a hot topic with numerous facets, beneficial for convenience, safety, costs, control and planning of road, rail, ship and air traffic.

Solutions of most different types already exist, as the following examples are demonstrating.

New technologies will foster even more convenient and efficient solutions in the future. Particularly in wireless communications innovations appear almost daily, in most cases just to disappear as rapidly. Technologies and solutions for the data capture and tracking in public passenger transportation must be durable, cross-border interoperable and compliant with International Standards and regulatory requirements.

For the planning, design and development of solutions and the assessment of opportunities and risks profound knowledge of today's and tomorrow's technologies as well as of customer, operator and manufacturer requirements is needed.

Objectives:

The project aims to:

- provide a systematic survey of possible types of electronic data capturing and tracking in multi-modal public passenger transportation.
- make identification of technologies and technical approaches.
- provide an investigation of user, operator and manufacturer requirements.
- provide an assessment of influencing factors such as standardization, regulation a.s.f.
- formulate of recommendations for implementation at the system level

Methodology:

In a first step, the technological solutions and research are examined on the subject. In particular, the areas of GSM / UMTS, Near Field Communication (NFC), Radio Frequency Identification (RFID) tracking and security are examined.

The wireless communication is standardized by ISO / IEC, ITU-T, ETSI, ECMA, IEEE and other organizations. In this organizational environment is therefore found information about the technologies that are standardized in 5 years and distributed nationwide in 10 years.

Relevant are in particular:

- Smart Card with 14443 and / or 15693 interface. Tags: architecture, combined with other chips and functions, distribution, interoperability.
- Mobile phones with NFC interface and connection to the mobile Internet. Tags: NFC, architecture, strengths and weaknesses, expected distribution.
- Tracking. Stich words tracking due to the network cells, with GPS, by other means (eg Vicinity), reliability, cost, distribution.
- Mobile connectivity. Tags: development of bandwidth, cost, distribution.
- Transaction processing. Tags: development of capacities and costs, advantages and disadvantages
of centralized and decentralized architectures.

Safety is an integral part of every service and every product. Use capture entails specific risks that should be analysed here.

In further phase inventory and requirements of user and operator perspective are to be set.

In this phase, the requirements for use of detection systems need to be added from the viewpoint of the operator. This can be done through specific interviews. As a framework, the possible fields of application have to be determined. In this and future applications are to be included. In addition, however, the solutions have to be assessed.

**Parent Programmes:**
ARAMIS - ARAMIS information system

**Institute type:** Public institution

**Institute name:** Swiss Government: State Secretariat for Education and Research

**Funding type:** Public (national/regional/local)

**Other funding sources:** 115'000.00 CHF

**Partners:**
Switzerland
Swiss Federal Roads Office
Amstein + Walthert Progress AG

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**Key Results:**

The study leads to the following recommendations:

- Evidence for the technical feasibility of a unified system for the detection of the use of the means of intermodal transport conveying persons. This exists not yet, but seems possible with an appropriate combination of several technologies.
- Analyse the benefits and the disadvantages of a system for the detection of the use of the means of intermodal transport conveying persons (unified system for rail and road) in comparison to a mono-modal system (multiple heterogeneous systems).
- Cooperation of the Swiss Federal Roads Department, the Swiss Association of Public Transport and the Swiss Federal Railways in the area of the detection of the use of the means of intermodal transport conveying persons with the incorporation and expertise of our results.
- Intensify the monitoring of foreign developments and a targeted participation in international activities, particularly in the area of standardization.
- The possible goals of passenger detection as well as its quality requirements need to be assessed.
- In order to guarantee the use of technologies across national boundaries, dependencies on specific producers have to be avoided.
- As for the project ETIK-BIBO, the trend towards mobile phones should not be missed; prepayment as well as post payment need to be taken into consideration.

**Documents:**
VSS2009/903 (Final report)

**STRIA Roadmaps:** Cooperative, connected and automated transport, Smart mobility and services

**Transport policies:** Digitalisation

**Geo-spatial type:** Other