Travel smarter with electronic ticketing

Translated reprint from:
Nahverkehrs-praxis, March 2013
In future, intelligent electronic ticketing solutions and networked transport systems throughout the mobility chain will make it easier for urban dwellers to reach their destinations in comfort, and ease the shift towards greater use of public and environmentally friendly modes of transport.

According to estimates, 60 percent of the world’s population will be living in urban areas by the year 2050. As one consequence, experts predict a rise in global passenger transport. Between 2005 and 2025, the number of journeys made by private transport is expected to grow by about 2.7 billion trips per day. But already today, many cities suffer from endless traffic jams, a shortage of parking spaces, and massive air pollution. In future, intelligent electronic ticketing solutions and networked transport systems throughout the mobility chain will make it easier for urban dwellers to reach their destinations in comfort, and ease the shift towards greater use of environmentally friendly modes of transport.

eTicketing provides one response to the challenges facing passenger transport today. Electronic tickets are not just a replacement of paper tickets. They offer a range of additional functions and, what is more, can be used across all modes of transport. Passengers can change flexibly between different modes of transport without losing time in purchasing individual tickets and selecting the correct fare. At the end of the journey, only the services actually used are billed electronically – an automatic, cashless, transparent and secure method of payment.

The electronic ticket: one ticket for all mobility needs

A key component in networking different modes of transport is the credit card-sized smartcard developed by Siemens. Featuring both an active and a passive RFID chip, its function is to log the individual journeys undertaken by its owner. The card can be used intermodally to pay for different means of transport and interoperably across the systems of different transport operators or authorities, as well as partner service providers. Using a single ticket, passengers can now access the whole range of transport services within a city or area covered by a transport association, change flexibly between different operators and also pay for additional services such as parking, admission charges or car rentals.

Thanks to its dual functionality, the smartcard is also versatile enough to use with different access systems. For
The need to optimize the traffic situation in our cities is growing at the rate of one inhabitant per second. And the citizens are joined every day by more and more commuters. Together, these two factors are causing rapid growth in urban traffic volumes. Against this background, a simple look at the current modal split, i.e. the splitting-up of a route over several transport operators, immediately shows that the strained transport situation can be traced back to the high proportion of private transport. Where this scenario will be leading to and what inner-city transport will be like in future can be witnessed already today in cities like São Paulo, the world record holder for daily traffic jams. This situation does not just entail negative environmental consequences like rising greenhouse gas emission; traffic congestion also has major economic consequences. Figures from the UK show for example that over 30 million hours of delays care accounted for by just 10% of all journeys. Estimates put the cost of congestion on the German economy at 100 billion euros per year in for Germany alone. These facts highlight the need to optimize the traffic situation in our cities. To counter the growing volume of traffic in a sustainable way, we need new and attractive transport concepts that will increase the share of environmentally friendly public transport in the modal split while supporting the intelligent combination of public and private transport. We need to implement convenient solutions that make it easy for big-city dweller to reach their destinations. We absolutely need seamless networking of different modes of transport and close coordination of the different transport options to achieve an optimum distribution of transport – which will benefit the urban quality of life and the environment and, last but not least, strengthen a city’s competitive position. That is what we are concentrating on.

What are the advantages of the BiBo principle?

eTicketing using Be-in/Be-out offers the passenger the highest level of convenience when using public transport. Equipped with a smartcard, perhaps carried in a rucksack or trouser pocket, passengers can use any type of transport that is linked to the eTicketing system without paying a moment’s attention to the ticket itself. Using contactless logging, so-called “room monitoring,” the card is scanned automatically upon boarding and alighting, and also periodically during the journey. The data on the routes used, any changes in class of coach, transfers between modes or breaks in the journey are collected by the background system and posted to the customer account. The services can be billed monthly, for example, and at the most favorable tariff available. Things don’t get any easier. From the passenger’s point of view, BiBo offers maximum convenience with minimum effort. The benefits for transport service providers are equally obvious. They can make their range of available transport options more attractive, minimize access barriers and increase passenger numbers. Automatic detection of the passengers’ travel routes and times gives service providers greater transparency on passenger numbers, preferred journey times and the degree of utilization of individual routes. This kind of detailed information helps optimize the deployment of vehicle fleets and opens up new options for fine-tuning tariff structures. For instance, regular users can enjoy discounts, or refunds can be accorded for using the transport system outside peak hours. This generates additional incentives, which in turn lead to better capacity utilization. Together with the drop in revenue losses due to fare evasion or the use of counterfeit or incorrectly selected tickets, this will help to reduce operating costs.

What is your vision for the urban mobility of the future?

Sustainable mobility will remain an important locational factor for cities and agglomerations and is of decisive significance for the cities’ competitiveness and quality of life. New mobility solutions are attractive and meet the needs of transport users, but at the same time they are economical and put minimum strain on people and the environment. Thanks to technological innovations, transport offerings across all modes of transport can be intelligently networked. End-to-end mobility chains and the smooth flow of traffic in urban areas have become reality. Intelligent mobility platforms precisely inform transport users – via apps, for instance – about the current traffic situation, give route recommendations and assist in selecting the best mode of transport. In parallel, travel behavior is subject to a shift in values: Privately owned cars are losing their significance as status symbols and no longer stand for freedom and individuality. Heightened awareness for the aspects and consequences of mobility and a more resource-efficient approach give center stage not to the mode of transport itself but to the appropriateness of its use in context. The pragmatic goal is to reach one’s destination in the quickest and most efficient manner, using a smart combination of different modes of transport. In a synchronized interaction of public transport services with bike- and car-sharing schemes and travel on foot, the private car is losing its special status. The shift from private motorized transport to public transport options brings further benefits. One example might be that superfluous parking space can be turned back into parks and green spaces, which once had to give way to a growing concentration of traffic.

Three questions to Nils Schmidt, Head of Road and City Mobility IT, a Siemens Business Unit

Why are you placing the focus of your solution development efforts on networking for transport operators?

These days, the population of the megacities is growing at the rate of one inhabitant per second. And the citizens are joined every day by more and more commuters. Together, these two factors are causing rapid growth in urban traffic volumes. Against this background, a simple look at the current modal split, i.e. the splitting-up of a route over several transport operators, immediately shows that the strained transport situation can be traced back to the high proportion of private transport. Where this scenario will be leading to and what inner-city transport will be like in future can be witnessed already today in cities like São Paulo, the world record holder for daily traffic jams. This situation does not just entail negative environmental consequences like rising greenhouse gas emission; traffic congestion also has major economic consequences. Figures from the UK show for example that over 30 million hours of delays care accounted for by just 10% of all journeys. Estimates put the cost of congestion on the German economy at 100 billion euros per year in for Germany alone. These facts highlight the need to optimize the traffic situation in our cities. To counter the growing volume of traffic in a sustainable way, we need new and attractive transport concepts that will increase the share of environmentally friendly public transport in the modal split while supporting the intelligent combination of public and private transport. We need to implement convenient solutions that make it easy for big-city dweller to reach their destinations. We absolutely need seamless networking of different modes of transport and close coordination of the different transport options to achieve an optimum distribution of transport – which will benefit the urban quality of life and the environment and, last but not least, strengthen a city’s competitive position. That is what we are concentrating on.

What are the advantages of the BiBo principle?

eTicketing using Be-in/Be-out offers the passenger the highest level of convenience when using public transport. Equipped with a smartcard, perhaps carried in a rucksack or trouser pocket, passengers can use any type of transport that is linked to the eTicketing system without paying a moment’s attention to the ticket itself. Using contactless logging, so-called “room monitoring,” the card is scanned automatically upon boarding and alighting, and also periodically during the journey. The data on the routes used, any changes in class of coach, transfers between modes or breaks in the journey are collected by the background system and posted to the customer account. The services can be billed monthly, for example, and at the most favorable tariff available. Things don’t get any easier. From the passenger’s point of view, BiBo offers maximum convenience with minimum effort. The benefits for transport service providers are equally obvious. They can make their range of available transport options more attractive, minimize access barriers and increase passenger numbers. Automatic detection of the passengers’ travel routes and times gives service providers greater transparency on passenger numbers, preferred journey times and the degree of utilization of individual routes. This kind of detailed information helps optimize the deployment of vehicle fleets and opens up new options for fine-tuning tariff structures. For instance, regular users can enjoy discounts, or refunds can be accorded for using the transport system outside peak hours. This generates additional incentives, which in turn lead to better capacity utilization. Together with the drop in revenue losses due to fare evasion or the use of counterfeit or incorrectly selected tickets, this will help to reduce operating costs.

What is your vision for the urban mobility of the future?

Sustainable mobility will remain an important locational factor for cities and agglomerations and is of decisive significance for the cities’ competitiveness and quality of life. New mobility solutions are attractive and meet the needs of transport users, but at the same time they are economical and put minimum strain on people and the environment. Thanks to technological innovations, transport offerings across all modes of transport can be intelligently networked. End-to-end mobility chains and the smooth flow of traffic in urban areas have become reality. Intelligent mobility platforms precisely inform transport users – via apps, for instance – about the current traffic situation, give route recommendations and assist in selecting the best mode of transport. In parallel, travel behavior is subject to a shift in values: Privately owned cars are losing their significance as status symbols and no longer stand for freedom and individuality. Heightened awareness for the aspects and consequences of mobility and a more resource-efficient approach give center stage not to the mode of transport itself but to the appropriateness of its use in context. The pragmatic goal is to reach one’s destination in the quickest and most efficient manner, using a smart combination of different modes of transport. In a synchronized interaction of public transport services with bike- and car-sharing schemes and travel on foot, the private car is losing its special status. The shift from private motorized transport to public transport options brings further benefits. One example might be that superfluous parking space can be turned back into parks and green spaces, which once had to give way to a growing concentration of traffic.
The Check-in/Check-out principle requires the user to scan the smartcard at the start and the end of the journey in a specific means of transport, allowing the system to log the different modes of transport used and the relevant legs of a journey (Pictures: Siemens).

systems using the Check-in/Check-out (CiCo) principle, the smartcard must be actively registered at the appropriate access control point at the start and finish of every journey: To do this, the passenger swipes the card over the control device when entering and leaving. The CiCo principle is not just for use on buses and trains but can also be applied to card readers at parking lots, car rental centers or bike-sharing locations.

More convenient for passengers is the Be-in/Be-out principle, which enables boarding and alighting from different modes of transport without actively swiping the smartcard over a reading device. The smartcard need not even be visible and may be carried in a purse, wallet or pocket. Upon boarding and alighting and also periodically during the journey, the card is scanned using contactless logging, so-called “room monitoring.” The completed journeys as well as any change in coach class are automatically logged and the most advantageous fare option is calculated for the passenger.

The Check-in/Check-out principle requires the user to scan the smartcard at the start and the end of the journey in a specific means of transport, allowing the system to log the different modes of transport used and the relevant legs of a journey (Pictures: Siemens).

The use of wireless components and mature technology has led to a significant cost reduction compared to earlier BiBo applications. The new system now features integrated architecture right through to billing. The process delivers benefits for passengers and operators alike. For this reason, by the year 2017, Swiss Railways (SBB) and the Swiss public transport authority Verband öffentlicher Verkehr (VöV) plan to switch all traditional ticket types to a single eTicketing scheme, which will offer the convenience of a subscription. This innovative scheme developed by Siemens was awarded the title of Transport Technology of the Year in the scope of the Transport Ticketing 2013 trade fair.

Siemens has created Germany’s most widespread mobile ticketing system with over 200,000 users. Since 2007, the Siemens subsidiary HanseCom has been operating and developing the Handy Ticket Deutschland system, centrally managed by the German transport business association, Verband Deutscher Verkehrsunternehmen (VdV). Over 25 passenger transport operators in 19 public transport regions are now linked to this interoperable system. For the Portuguese rail operator Comboios de Portugal (CP), Siemens has developed an eTicketing solution that enables seamless networking with the multimodal transport operator OTLIS in Lisbon. Operating according to the CiCo principle, the system was integrated into existing infrastructure and is based on international Calypso RFID standards.

In the role of system integrator, Siemens provides key hardware such as access gates, validation devices and video monitoring systems, which are managed and controlled by a central management system and maintained by Siemens. Specific customer requirements concerning passenger flow, security mechanisms and operating procedures are given special consideration.

“eTicketing in public transport has become a reality. The next step is networking the different transport providers in order to simplify intermodal journeys and make it easier for travelers to switch to public transport,” explains Nils Schmidt, Head of the Siemens Business Unit “Road and City Mobility IT.” A single app can provide additional location-specific services such as route planning, navigation and real-time information on service disruptions, making travel more convenient before, during and after the trip through improved transparency for everybody involved.

Siemens ticketing solutions are already in use in many projects worldwide

The electronic ticket can also be used via alternative access media such as mobile phones and smartphones.

Siemens has created Germany’s most widespread mobile ticketing system with over 200,000 users. Since 2007, the Siemens subsidiary HanseCom has been operating and developing the Handy Ticket Deutschland system, centrally managed by the German transport business association, Verband Deutscher Verkehrsunternehmen (VdV). Over 25 passenger transport operators in 19 public transport regions are now linked to this interoperable system. For the Portuguese rail operator Comboios de Portugal (CP), Siemens has developed an eTicketing solution that enables seamless networking with the multimodal transport operator OTLIS in Lisbon. Operating according to the CiCo principle, the system was integrated into existing infrastructure and is based on international Calypso RFID standards.

In the role of system integrator, Siemens provides key hardware such as access gates, validation devices and video monitoring systems, which are managed and controlled by a central management system and maintained by Siemens. Specific customer requirements concerning passenger flow, security mechanisms and operating procedures are given special consideration.

“eTicketing in public transport has become a reality. The next step is networking the different transport providers in order to simplify intermodal journeys and make it easier for travelers to switch to public transport,” explains Nils Schmidt, Head of the Siemens Business Unit “Road and City Mobility IT.” A single app can provide additional location-specific services such as route planning, navigation and real-time information on service disruptions, making travel more convenient before, during and after the trip through improved transparency for everybody involved.

Siemens has created Germany’s most widespread mobile ticketing system with over 200,000 users. Since 2007, the Siemens subsidiary HanseCom has been operating and developing the Handy Ticket Deutschland system, centrally managed by the German transport business association, Verband Deutscher Verkehrsunternehmen (VdV). Over 25 passenger transport operators in 19 public transport regions are now linked to this interoperable system. For the Portuguese rail operator Comboios de Portugal (CP), Siemens has developed an eTicketing solution that enables seamless networking with the multimodal transport operator OTLIS in Lisbon. Operating according to the CiCo principle, the system was integrated into existing infrastructure and is based on international Calypso RFID standards.

In the role of system integrator, Siemens provides key hardware such as access gates, validation devices and video monitoring systems, which are managed and controlled by a central management system and maintained by Siemens. Specific customer requirements concerning passenger flow, security mechanisms and operating procedures are given special consideration.

“eTicketing in public transport has become a reality. The next step is networking the different transport providers in order to simplify intermodal journeys and make it easier for travelers to switch to public transport,” explains Nils Schmidt, Head of the Siemens Business Unit “Road and City Mobility IT.” A single app can provide additional location-specific services such as route planning, navigation and real-time information on service disruptions, making travel more convenient before, during and after the trip through improved transparency for everybody involved.

Siemens has created Germany’s most widespread mobile ticketing system with over 200,000 users. Since 2007, the Siemens subsidiary HanseCom has been operating and developing the Handy Ticket Deutschland system, centrally managed by the German transport business association, Verband Deutscher Verkehrsunternehmen (VdV). Over 25 passenger transport operators in 19 public transport regions are now linked to this interoperable system. For the Portuguese rail operator Comboios de Portugal (CP), Siemens has developed an eTicketing solution that enables seamless networking with the multimodal transport operator OTLIS in Lisbon. Operating according to the CiCo principle, the system was integrated into existing infrastructure and is based on international Calypso RFID standards.

In the role of system integrator, Siemens provides key hardware such as access gates, validation devices and video monitoring systems, which are managed and controlled by a central management system and maintained by Siemens. Specific customer requirements concerning passenger flow, security mechanisms and operating procedures are given special consideration.

“eTicketing in public transport has become a reality. The next step is networking the different transport providers in order to simplify intermodal journeys and make it easier for travelers to switch to public transport,” explains Nils Schmidt, Head of the Siemens Business Unit “Road and City Mobility IT.” A single app can provide additional location-specific services such as route planning, navigation and real-time information on service disruptions, making travel more convenient before, during and after the trip through improved transparency for everybody involved.

Siemens has created Germany’s most widespread mobile ticketing system with over 200,000 users. Since 2007, the Siemens subsidiary HanseCom has been operating and developing the Handy Ticket Deutschland system, centrally managed by the German transport business association, Verband Deutscher Verkehrsunternehmen (VdV). Over 25 passenger transport operators in 19 public transport regions are now linked to this interoperable system. For the Portuguese rail operator Comboios de Portugal (CP), Siemens has developed an eTicketing solution that enables seamless networking with the multimodal transport operator OTLIS in Lisbon. Operating according to the CiCo principle, the system was integrated into existing infrastructure and is based on international Calypso RFID standards.

In the role of system integrator, Siemens provides key hardware such as access gates, validation devices and video monitoring systems, which are managed and controlled by a central management system and maintained by Siemens. Specific customer requirements concerning passenger flow, security mechanisms and operating procedures are given special consideration.

“eTicketing in public transport has become a reality. The next step is networking the different transport providers in order to simplify intermodal journeys and make it easier for travelers to switch to public transport,” explains Nils Schmidt, Head of the Siemens Business Unit “Road and City Mobility IT.” A single app can provide additional location-specific services such as route planning, navigation and real-time information on service disruptions, making travel more convenient before, during and after the trip through improved transparency for everybody involved.
From A to B with E

eTicketing – the electronic ticket – provides an answer to the current challenges facing public transportation. Siemens pools different modules of eTicketing solutions and areas of expertise. It can therefore offer complete systems along the entire value chain from a single source.
The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.