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Making smart journeys

With widespread adoption and seemingly limitless capabilities, smartphones are revolutionising how passengers use and interact with rail transport. **Frank Nosbers**, senior consultant at BearingPoint, considers current and future smartphones uses, which he argues could benefit public transport as a whole.

WHETHER it is for planning a journey, finding comprehensive traffic information, or paying for a ticket, mobile phones have been in widespread use in the transport sector as a business and revenue tool for many years.

However, the full potential of mobile phones, in particular smartphones, has not yet been fully realised. Issues such as a lack of complete coverage on some networks, the problems posed by roaming charges which can eliminate some users from the market, and the sparse rollout of 4G and even 3G services in certain areas continue to pose challenges.

But with more than 1.75 billion smartphones in use across the world and with at least 50% of the population owning one in 18 countries, the smartphone is clearly here to stay and work is continuing to develop future

solutions to increase its use within public transport.

So what barriers to achieving this exist? This article focuses on current and future use of smartphone technology in the rail sector in Europe, the basic principles of European Union (EU) transport telematics policy and the current status of cross-regional and cross-modal information technologies and solutions. It concludes by considering current and future applications, and how any obstacles might be overcome.

EU transport telematics policy foresees the use of the latest technologies to increase transport efficiency and safety and is a critical element in efforts to achieve the goals of the EU's 2011 White Paper on Transport. This document proposes the development of a European transport area by 2050, which is environmentally

and user-friendly, and offers:
- a level playing field for long-distance travel and intercontinental freight
- an efficient core network for multimodal passenger and freight transport including well-connected transport systems, and
- clean transport solutions in urban areas.

Telematics solutions specifically encompass intelligent transport systems (ITS). Here computers, electronics, satellites, smartphones and sensors are all integrated and networked to collect, transfer, process and use traffic-related data to improve the organisation of transport, and potentially introduce new services.

The European Parliament and Council Directive 2010/40 of July 7 2010 was the first legal basis for ITS. It specifies the functional, technical, and organisational or service guidelines required to provide compatible, interoperable and continuous ITS solutions across the EU.

The directive left it to the individual states to decide on a system to deliver these objectives, with the

German Rail's Qixxit smartphone app offers door-to-door travel planning for all modes of transport across Germany and shows journey times and prices for its services as well as direct competitors.
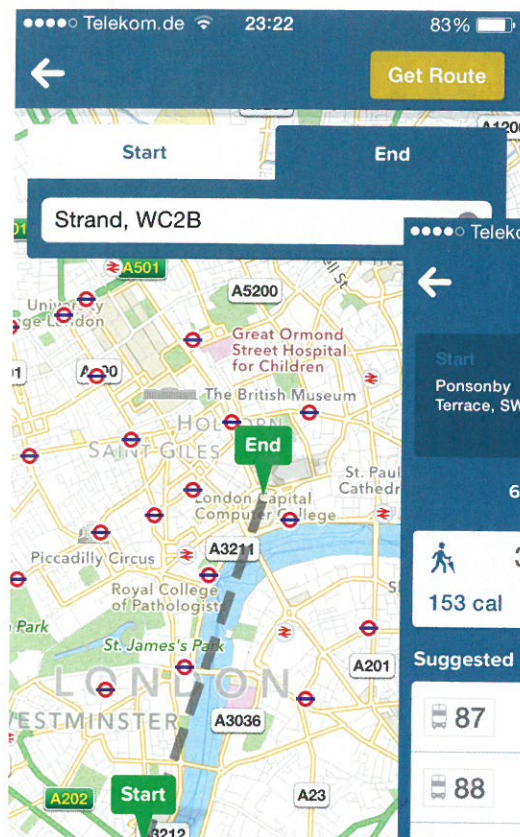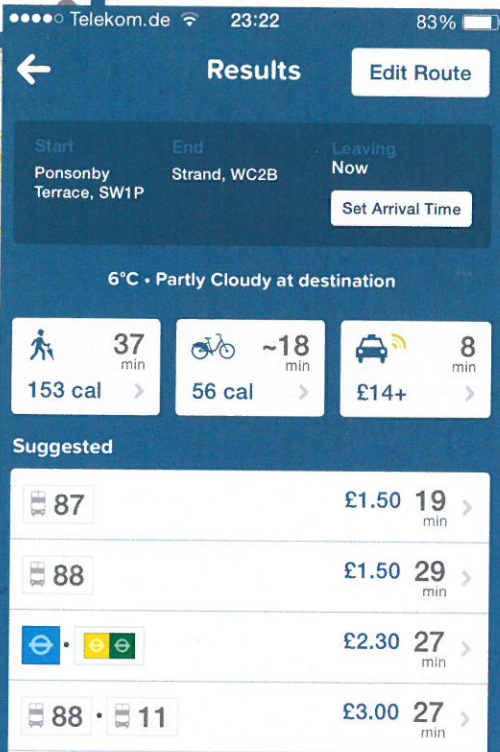
Citymapper suggests different modes of transport to reach destinations like bars and restaurants. Directions can also be sent to friends via social media, SMS, or email.

With more than 50 million active smartphones currently in use in Europe, they are considered the key tool to delivering telematics solutions to passengers.

Smartphones provide an

initial focus on road transport and its interfaces with other modes. However, article 3 defines two initiatives which are impacting rail and public transport:
• the provision of EU-wide multimodal travel information services, and
• the provision of EU-wide real-time traffic information services.

avenue for public transport authorities and operators to relay data and information which can immediately answer common operations questions such as the location of the next stop, which line goes to a specific station, and the optimal route for a specific service. In addition, it is also possible to use

smartphones for payments and ticketing, either through the internet or Near Field Communications (NFC) technology. By holding information such as a passenger's age, the smartphone can eliminate irrelevant tariff structures and fares shown at the ticket machine, saving time and easing the process for irregular public transport users.

Transport behaviour has changed markedly in recent years and for the "virtual network" generation, there is huge potential for information delivered via a smartphone to dictate their transport mode of choice. Traditionally, the chosen mode was decided by personal chattels; if you own a car, you use your car. However, transport choice is now more often dictated by availability, travel times and prices, with the smartphone providing immediate answers to these questions.

As a result transport operators are increasingly providing travel information and services online through mobile apps and social media platforms, all of which are accessible via a smartphone. But there are new players in the market with their primary business not necessarily public transport (see panel). While these apps and platforms differ in their functionalities they remain in competition to a certain degree. As the user, the passenger actively decides this contest, which means that some apps are likely to disappear if they are unpopular.

ITS smartphone technology is both a blessing and curse for operators: substantial potential exists to acquire new public transport customers by

placing all modes of transport in direct and transparent competition with each other. Nevertheless the threat of low-cost airlines and long-distance bus service to high-speed, inter-city and overnight train services through cheaper travel is a concern.

However, rail operators cannot live in a bubble. As a result the rail industry should prepare for current and future travel requirements and promote rail as the mode of choice by:

• providing constant availability of data such as timetables, real-time information, onboard trains and at stations
• improving quality through better punctuality, rolling stock availability, and passenger comfort, and
• reducing the cost of travel in reaction to offering full transparency with other modes.

Limitations

While offering a high-level of service to attract passengers presented with a clear choice between modes is obviously desirable, rail operators face a number of challenges to deliver these objectives. Providing an onboard Wi-Fi service is one way of achieving this with many long-distance bus operators, which offer poorer journey times compared with rail, now offering free Wi-Fi hotspots as a standard service.

Rail operators are following suit with rolling stock upgrades underway across Europe and the provision of these services set to be a mandatory requirement in the future. However, rail currently faces limitations in its capability to deliver a reliable onboard Wi-Fi service. The rollout of infrastructure that offers mobile broadband and Long-Term Evolution (LTE) 4G is incomplete, and in areas where the service is available, a high number of Wi-Fi users accessing the service limits the browsing speed.

Current wireless capabilities also vary between countries; in Scandinavia and the Netherlands connections are generally good, while in Germany all high-speed trains are now fitted with Wi-Fi in first class with second class set to follow by the end of 2016. In Britain, the government requires free connectivity on all trains operating in England and Wales from 2017. Yet many other countries are not making the same level of commitment to deliver universal connectivity and this is an important issue that railways, telecommunication providers and states must solve.

Data availability is also patchy at present, particularly in Eastern Europe. An open system where all operators from all modes share information to the benefit of all is desirable because it will increase trust from passengers seeking the best journey, with people increasingly receiving this information via their smartphone.

In return, information derived from these sources can inform smart intelligence or "big data" systems, which help operators to target specific customers and enhance their service. Freedom of availability and use of this data is clearly in the public interest but how this actually takes place in practice remains under discussion. Concerns surround data ownership and sovereignty as well as whether open data is actually beneficial to transport companies as well as the associated implications surrounding a "loss of control."

However, there are examples of operators which are providing free and unlimited access to their traffic data and route information to the benefit of their passengers.

Following New York Metropolitan Transportation Authority's (MTA) release of its timetable, station and line extension data a flood of third-party smartphone applications with various functionalities emerged on the market. Along with a range of comprehensive journey planner applications, other creative apps include "Train Smoker," which can tell a user how much time they have to smoke before the next train arrives and "Exit Strategy" which shows the best locations to board or exit a specific train to minimise waiting times. MTA has since awarded prizes to the developers of the best applications through the annual MTA App Quest and provides links to relative apps across various operating systems from its website.

While this trend is encouraging, operators are advised against developing apps as a means to generate additional revenue. The public willingness to pay remains low because there is a general conception that these applications are free because the information is readily available elsewhere. Instead app usage should be considered as a means to reduce costs as it potentially can limit the number of ticket machines, ticket counter staff and timetable print products required. A synonymous example in the telecommunications industry is the huge reduction in public pay phones following the growth of the mobile

App developers

Public transport operators or regional transport associations: offer data from timetables and real-time service information through in-house smartphone applications. German Rail (DB) has taken this a step further by founding a new start up for its smartphone-based business, Qixxit (see caption p37).

Cross regional initiatives/associations: Several regional public transport operators and/or associations are combining their local information into joint apps/platforms. For example OEFFI offers real-time information about the next bus/tram stops and door-to-door travel plans with interactive network maps in 11 European countries, but not all regions and towns.

Automotive: With car sharing set to increase, some car sharing providers and car manufacturers have developed mobility apps to boost contact with customers. "Moovel" is designed for passengers in congested urban areas in Germany and combines offerings from transport providers, including car sharing, bike rental, and public transport.

IT/platform providers: Some providers are extending Google Maps, a road-based visualisation, to other modes of transport on an international scale. These include GoEuro, EU-Spirit and Citymapper (pictured left), which covers Paris, London, Berlin, and New York.

phone. Yet with the smartphone evolution not yet complete, it is too early to speculate on an optimal funding model for ITS investments that provide a fair distribution of costs.

While coordination efforts for ITS initiatives do clearly exist, more EU countries and regions should engage with this process and provide their traffic data to facilitate the provision of seamless and transnational traffic information.

Providing transport services and information such as service updates, ticket reservations and payments, and real-time travel information via smartphones is a critical step. It is now up to railways and public transport providers to look beyond their competitive instincts and play an active role in facilitating this shift, which will enhance the journey experience for passengers and strengthen public transport as a whole. **IRJ**