Hands-free access: Secure long-range RFID brings enhanced travel experience to users of public transport networks

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Tech brief

Accessing public transport hands-free – that is, without having to tap a card or ticket to a reader – makes it easier for everyone to get around.

A better way to access public transport

For millions of people around the world, particularly the elderly and those with physical disabilities, accessing public transport can present a serious challenge. The simple act of reaching into a pocket or bag to retrieve a ticket and then presenting it to a ticket-reading terminal can be extremely difficult to perform, if not impossible.

People who might otherwise be able to get around on their own may need a travel companion or assistance from strangers to use their ticket and enter the public-transport system. Having hands-free access to public transport, without the need to bring a ticket close to a reader, could mean new levels of freedom and mobility for people who currently have difficulties using public transport.

At the same time, hands-free access offers **added convenience and speed** for everyone else traveling on public transport networks. Even though contactless tickets make it much **easier and faster** to pass a subway turnstile, board a bus, or ride a train, it still takes time to find and present the ticket. Doing away with the need to physically tap the ticket to a reader would make using public transport much easier, and much more enjoyable, and would help keep things moving during periods of heavy usage.

The next level of convenience

Many public-transport agencies have already replaced traditional ticketing systems, which use cash payments or simple paper tickets, with contactless schemes that involve contactless paper tickets or contactless smartcards based on Radio Frequency Identification (RFID).

The next level of convenience and speed for public-transport users involves a new type of contactless RFID technology that's completely hands-free. Whereas traditional contactless technology operates over a short distance of just a few centimeters (about an inch or two), the new format can read over a much longer range of up to several meters (10 feet or more). The paper ticket or smartcard can stay in your pocket, backpack, or purse, and still be readable.

The concern, of course, is security. Any contactless paper tickets or contactless smartcards used in public transport need to offer a certain level of security, since they carry a monetary value and grant certain rights and privileges. For some time now, short-range RFID technologies have met this need, and have continued to provide increasing levels of protection. By contrast, long-range RFID technologies haven't offered the necessary levels of security to protect privacy and safeguard data against cloning. As a result, concerns about identity theft and unauthorized tracking have basically eliminated long-range RFID as an option for public transport.

But that's about to change.

A new generation of secure, long-range solutions

The latest implementations of passive long-range RFID come with cryptographic features that are designed specifically to supports the needs of public transport and other applications that require high levels of security. These features protect the privacy of those carrying cards or tickets, and guard against unauthorized tracking. The new features also protect system operators by preventing fake tickets or cards from entering the system, and by effectively blocking attempts at fraud.
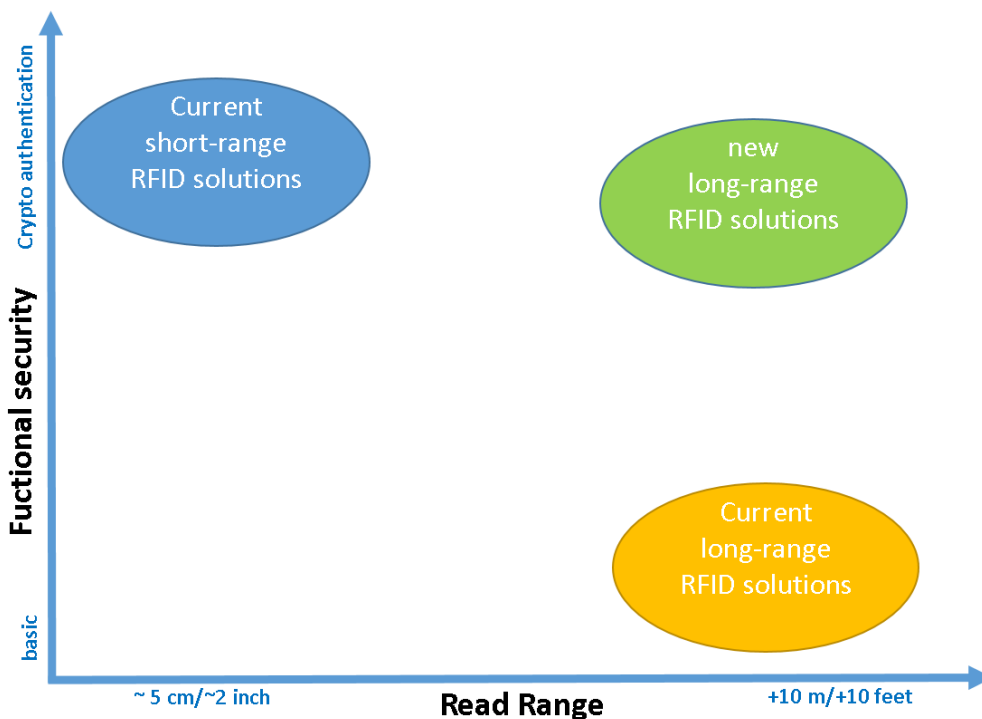
The latest long-range RFID solutions meet the need for high read range plus high security

Availability of cryptographic authentication in long-range RFID means that developers of ticketing systems don't have to choose between contactless performance and security. They can even **combine high-end, multi-application secure smart cards with secure long-range RFID**, to create the best possible solution, without compromising convenience or privacy.

Looking ahead

Building blocks for secure long-range RFID with cryptographic authentication are already in place and companies such as NXP, Cubic Transportation Systems and Kathrein RFID have joined forces to explore end-to-end solutions based on this exciting new technology. NXP is a leader in securing connections between smart objects in our increasingly networked world. Cubic is a leading integrator of payment and information technology for public transit authorities and operators, and Kathrein is a systems and solutions provider for connected communications technologies. This collaboration aims to set the convenience bar even higher for travelers on public transport networks.

Future ticketing systems are thus likely to involve hands-free access, at least for some categories of users, especially those with physical difficulties. Over time, the benefits of improved convenience and speed while maintaining security are likely to extend to all users. What's more, system integrators focused on public transportation, as Cubic is, can be instrumental in offering long-range RFID with cryptographic authentication as one of the technology options available to transport service operators to build on today's existing systems while offering travel experiences of even higher quality.

Take the next step

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