



LEAP CARD

Expanding Ticketing while Shrinking Costs and Delivering Superior Customer Experience



In 2011, when Ireland's National Transit Authority (NTA) introduced the Leap Card, a MIFARE product-based smart card for securely purchasing, storing, and using transport tickets, people were immediately drawn to its convenience and ease of use.

Building on their initial success in Dublin, the NTA quickly began expanding service to other regions. Today the Leap Card is accepted in Cork, Galway, Limerick, Waterford, and Wexford, and supports more than 130 million journeys a year on bus, light-rail, and train services. More than 2.3 million Leap Cards are now in circulation, and the automatic fare collection (AFC) scheme generates more than 240 million Euros in revenue through ticket and top-up sales each year.

RAPID SUCCESS

Here's what Leap Card has achieved in just 8 months with mobile integration:

- 150,000 app downloads
- 14,700+ mobile tickets collected
- €19.8 million total top-ups
- €2.12 million monthly usage rate (May 2017)
- 13.9% mobile share of top-ups (May 2017)



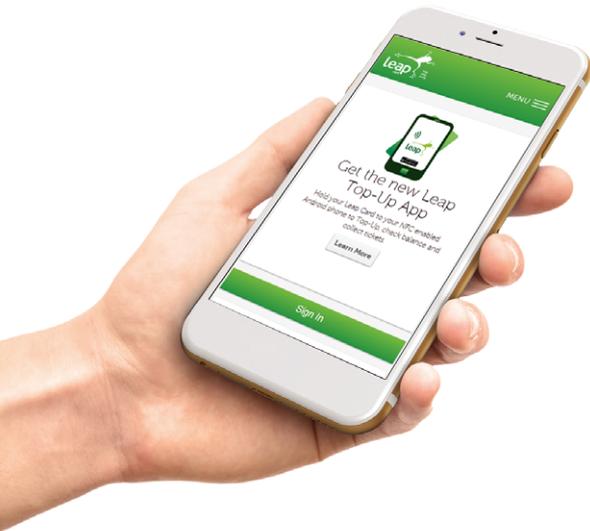
The Reload Challenge

The Leap Card was introduced in 2011 and with its rapid expansion, however, came new challenges in terms of coverage and convenience. It wasn't always easy for people to reload credits or top up their cards using physical ticket-vending machines.

For example, a number of Irish employers offer monthly Leap tickets to their employees, but reloading credits onto the cards involved someone having to go to a Leap ticket machine and add credits to each individually. The budget for smart ticketing machines was another consideration. The average cost of installing a ticket-vending machine is around 20,000 Euros, which meant that extending the network to include load services and retail top-up points in rural and remote areas was an expensive proposition.

Not wanting to rely solely on vending machines, the NTA began looking at online services for ticketing and top-ups. One option was the popular programming interface, called ActionLists, which pushes ticket purchases to the reader network so the network can update the smart card the next time it's used. But the technical requirements for ActionLists didn't match what was already installed on NTA buses, making it both impractical and expensive to implement.

Failing to find a good option with off-the-shelf infrastructure solutions, the NTA decided to pursue a more innovative approach. Taking advantage of the widespread adoption of NFC-enabled devices, they decided to use what most people already carry with them – their mobile phones.



MIFARE for Secure Mobile Top-ups

By using NXP's MIFARE DESFire EV1 contactless ICs to power their Leap Cards, the NTA could take advantage of two features that would make smartphone interactions a safe and convenient choice. First, MIFARE DESFire EV1 is compatible with ISO/IEC 18902, the standard for Near Field Communication (NFC), so any NFC-enabled device can interact with a Leap Card. Second, the security features in MIFARE

DESFire EV1 create a secure channel between the smart card and the server, even if a smartphone is used as the card reader, so Leap Card users can be confident that their transactions will remain private and protected.

When the NTA began working on the Leap Card, they found that their legacy contactless format, MIFARE Classic®, was too difficult to scale and, perhaps more important, didn't provide the necessary level of security. They chose to use MIFARE DESFire EV1 instead, because it offers a much higher degree of protection and supports a wider variety of customer-centric services. In particular, MIFARE DESFire EV1 safeguards transit-agency data while letting consumers use their NFC-enabled phones for secure interactions with the system. (Please contact NXP for more information on a smooth migration from MIFARE Classic to MIFARE DESFire.)

More Coverage with Less Investment

In the end, the NTA was able to create their mobile top-up solution with an investment that represented a single-digit percent of the overall rollout of the AFC system. What's more, it took only a few weeks to prepare the solution for launch, and the go-live team consisted of only four people. To save on long-term operating costs, and make it easier to keep expanding the online services, the NTA now manages the mobile service themselves, in the cloud.

Big Returns

Only eight months after rollout, the mobile application has been downloaded by 150,000 users who have used it for an aggregated top-up value of 19.8 million Euros. (According to NTA, a smartphone is enabled for contactless communication with a Leap Card about once every second.) A total of nearly 15,000 tickets have been collected with the mobile service, and an additional 6,000 ticket renewals have been carried out from remote locations. The monthly top-up rate is growing quickly, with the numbers for May 2017 amounting to 2.12 million Euros, or nearly 14% of all top-ups.

Using MIFARE DESFire EV1 ICs as the basis for the Leap Card let the NTA dramatically increase their coverage while keeping large infrastructure investments at bay. Having invested in only a transparent client application, for user interaction with mobile devices, and a central, secure, cloud-based management solution, the NTA has kept their costs to an absolute minimum, while creating a direct customer-relationship management platform that delivers best-in-class service and convenience.

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Leap Card
www.leapcard.ie

Ireland's National Transport Authority (NTA)
www.nationaltransport.ie

NXP's MIFARE DESFire EV1 Contactless IC
www.mifare.net/mifare-desfire-ev1

