Calypso Live

A round-the-world
tour of Calypso
deployment highlights

Calypso
Networks Association

Welcome

Commuters today expect public transport to provide seamless experiences to encourage its use over private vehicles. From the first to the last step of their journey, passengers demand convenient, flexible ticketing options that span multiple modes of transport and that are secure, widely available, and easy to manage.

Responding to these demands is a big challenge for Public Transport Authorities and Operators. Supporting fare flexibility, developing effective Mobility-as-a-Service (MaaS) policies and developing an overall smarter, more inclusive contactless experience require sophisticated and innovative solutions.

For over 25 years, Calypso®, an open, secure ticketing standard has supported contactless ticketing for millions of passengers worldwide. For ticketing transactions, Calypso offers openness, security, and speed, enabling all ticketing functions: purchasing, loading, validation, and control of ticketing, for all kinds of transport contracts.

In the following pages, we share a snapshot of how transit networks for some of the biggest, most beautiful, and unique cities and regions in the world are using Calypso solutions and standards to fulfil their ticketing needs. You will learn the many ways that Calypso solutions can be deployed to engage passengers, simplify complex ticketing, promote agility and sustainability, and improve the journeys of people around the world.

As an open ticketing standard, shaped by the community, for the community, Calypso is found in more than 170 cities across 25 countries, and it is our aim to expand this number in the coming years. Naturally, we could list every occurrence of Calypso around the world in this eBook, but we have selected just some examples of how Calypso unlocks a smarter, inclusive contactless ticketing experience.

Are you ready to start your smart ticketing journey? Find out more about Calypso and Calypso Networks Association on calypsonet.org or contact us to speak to one of our experts.

Bordeaux

Authority:

TBM TRANSPORTS BORDEAUX MÉTROPOLE

AT A GLANCE:

↗ Over 6,000 square kilometres

👤 Home to more than one million people

🚊 Four tram lines

🚌 80 bus lines

Situated in the heart of France's famed wine-growing region, Bordeaux is a busy port city on the Garonne River. Public Transport Authority Bordeaux Métropole runs the city's network of trams and buses in conjunction with Keolis, operator of TBM (Transports de Bordeaux Métropole) and relies on Calypso Prime for its smartcard ticketing infrastructure.

- To improve the experiences of Bordeaux's public transport passengers, Bordeaux Métropole and Grand Port Maritime de Bordeaux teamed up to launch a new multi-application smartcard as part of an ambitious and innovative mobility initiative.
- The card, developed using the **Calypso** and **Application Multi-Services Citoyenne (AMC)** standards, offers seamless access to the area's port facilities as well as public transport services throughout the Bordeaux City region.

The project strengthened the links between the port and the town and allows residents and tourists alike to travel seamlessly and securely across the region.

Calypso solutions deployed:

- Multiservice AMC
- Calypso Prime
- HCE
- ABT
- Hoplink

Spotlight — Ticketing for MaaS – the challenge

One of the biggest trends shaping the future of urban transit is supporting the first and last step of every passenger's journey. This is nudging networks to increase their focus on offering a joined-up, seamless ticketing experience, accommodating the flexibility of MaaS and the multimodal offering it supports.

Mobile ticketing (m-ticketing) will become a big driver of MaaS adoption, enabling multimodal ticketing from a device many people already carry with them everywhere. However, with cards remaining a key tool in the transit planner's portfolio for the long term, ticketing smartcard solutions must also offer the same level of integration and convenience for passengers. By enabling this, transit networks can create an inclusive MaaS offering - MaaS **for all.**

This ambition for MaaS ticketing will only be achieved if systems are well designed and highly scalable. This is indeed a major challenge, and the need for ticketing systems to be flexible has never been so great. Yet ticketing systems, which are sometimes subject to vendor-locking do not always provide the appropriate solutions to this challenge.

Open ticketing technology, shaped by the community, for the community will be essential.

"Public transit in Bordeaux is an essential part of our infrastructure, supporting citizens and tourists alike, and having a smart, reliable and secure contactless solution is essential. Using Calypso helped us tailor a unique solution to suit our city's needs, allowing us to stay ahead of transit trends and offer a joined-up solution."

Jean-Marc Rouffet
Director of Transport Systems and Equipment, Bordeaux Métropole

Brussels

Authority:

AT A GLANCE:

👤 Home to nearly 2.5 million people in the greater metropolitan area

🚊 87 bus, tram, and metro lines

🎟 415 million passengers each year

📡 4.6 million EMV® validations per year

🏷 263 million Calypso card validations per year

Brussels is considered by many to be the geographic, economic and cultural crossroads of Europe. To effectively serve the inhabitants of Brussels, as well as the millions of tourists who visit each year, **the Brussels Intermunicipal Transport Company (STIB-MIVB)** network operates four metro lines, 17 tram lines, 55 bus lines and 11 night bus lines, known as Noctis, across the greater metropolitan area.

The network places a strong emphasis on passenger comfort, convenience, and mobility. To promote these values, STIB-MIVB uses the **MoBIB** smartcard. Using **Calypso Prime**, MoBIB smartcards facilitate easy, seamless ticketing throughout STIB's network and throughout all of Belgium's transport networks; MOBIB is interoperable in the whole country.

Calypso solutions deployed:

- Calypso Prime
- ABT
- HCE
- Hoplink

Multiservice offering supported:

🚲 Bicycle sharing

🚲 Bike parks

🛵 Scooter sharing

🅿 Parking

To help incentivise passengers away from private vehicle use and support the city's commuters, STIB enables employers to load transport tickets onto a MoBIB card with a deferred payment option, some of which can be paid by the employer. So far, STIB has issued approximately two million MoBIB cards to passengers throughout the Brussels region.

It's not just in Brussels where you will see MoBIB cards. The MoBIB smartcard is the contactless ticketing solution used by the four public transport operators throughout Belgium (STIB, SNCB, De Lijn, TEC). It is also used by additional users throughout the nation's public transport community e.g., Interparking: car parks; Villo: bike sharing; Cambio: car sharing. Many MOBIB cards include Hoplink and passengers can access partner transport services in other European networks. Approximately eight million MoBIB cards have been issued throughout Belgium.

Spotlight Calypso and open loop

STIB/MIVB has chosen to offer its customers the possibility of using their EMV bank card as a ticket, by implementing an open payment solution, which allows the acquisition and use of transport rights by using a bank card directly at the network's entrance terminals, in a Pay as you Go modality. It completes its ticketing offer to accept occasional use of its transport network more easily and efficiently.

Open-loop is a perfectly complementary solution to a closed loop open standard ticketing system such as Calypso, to cover all categories of users and increase the ease of access to public transport and therefore its attractivity.

"We have to serve our customers every day and offer a public transport service of the highest quality. That is our ambition. STIB places customers at the heart of all its actions. To make public transport even more attractive, we are improving the customer experience every day by offering a wide range of quality services that incorporate new mobility solutions."

Jean-Luc Van Ginder Deuren
Head of IT Sales Solutions Department, STIB-MIVB

Campania
Region

Authority:

UNICO CAMPANIA

Operators (+14), including:

TRENITALIA

EAV official

anm

AT A GLANCE:

↗ Covers over 13,500 km²

👤 Home to almost 6 million people in the region

⚙ 550 municipalities

🧴 1.5 million passengers a day

🚌 24,000 busses a day covering 356,000 Km

🚋 2,200 trains a day, covering 49,000 Km

Calypso solutions deployed:

· Calypso Prime
· Calypso Light
· HCE

With its stunning coastline, archaeological history and rich culture, the Campania region is one of Italy's most distinct and recognisable territories. To meet the unique transportation needs of the area, the UnicoCampania Consortium provides the region's inhabitants and tourists with integrated tariff structures for seamless mobility between the myriad busses, trains, and boats used to service passengers.

Each member of the Consortium has delegated the management of its corporate ticketing chain to this centralised agency, including integrated regional fares, to make over 1,000 types of single, hourly or seasonal tickets easily accessible and usable across public transport throughout the region.

This has allowed operators across the network to take advantage of a centralised Automatic Fare Collection (AFC) system based on Calypso cards, which allows concessionary fares to be easily applied. Operators can issue discounted tickets to eligible demographics, including police forces and students, to make sure that seamless mobility is accessible to all.

UnicoCampania is also developing a HCE Calypso offer for its Android smartphone app, as an alternative to physical Calypso cards, which will provide the same security levels and user experience for end users throughout the regional transport network.

"By underpinning our centralised AFC system with Calypso, we're able to provide passengers throughout Campania with the same seamless and secure user ticketing experience, wherever they are in our network. And with integrated regional fares available from over 3,000 third-party ticket vendors, they can be confident that they are getting value for money, without unnecessary friction."

Guido Cangiano
Chief Technology Officer, UnicoCampania

Casablanca

Authority:

CASA
TRANSPORTS SA
Pour vous simplifier la ville

AT A GLANCE:

👤 Home to over 4.2 million people

🚋 47 km Casatramway network with 70 stations

🚌 1,102 km Casabus network with 1,812 stops

🧳 498,900 daily journeys

A bustling port city and commercial hub on Morocco's Atlantic coast, Casablanca is undergoing an exciting digital transformation. The initiative impacts all sectors of Moroccan society, from e-gov to commerce and transportation, and incorporates governance, biometrics, and identity passports for all digital transactions, including automobile licensing and registration and transport ticketing.

Casa Transport SA has based the **Casablanca Public Transport Exclusive Right of Way Network** ticketing system on **Calypso** open standards technology, enabling transporting ticketing to easily merge with Morocco's larger digital transformation efforts.

Today, residents of Casablanca are poised to benefit from digital ticketing as the city moves to support and deploy a wide range of digital services and promotes multi-modal travel across the city.

Calypso solutions deployed:

· Calypso Prime

"Casatramway is pioneer Nationwide in terms of state of art systems and ticketing equipment. Since the beginning of the project, the aim has been to offer a seamless multi-modal travel experience. As the network is developing from 2 operating tramway lines to 4 tramway lines, 2 bus lines and a new bus service, it was important to ensure the systems are truly interoperable and provide an evolving sustainable framework. Calypso Networks Association was thus contracted by Casa Transport for support, and they have conducted the mission with success."

Nabil Belabed
General Director, Casa Transport

Dakar

Authority:

CETUD

AT A GLANCE:

👤 Home to four million people
in the metropolitan area

🧴 Over seven million daily journeys

🚏 An 18.3 km BRT system

🚌 144 articulated electric buses

🚌 38 standard bus lines

🚌 72 midibus lines

⚙️ Multiple artisanal transit providers

Calypso solutions deployed:

· Calypso Prime
· Hoplink

As one of the fastest growing cities in Africa, Dakar faces an ever-increasing challenge of ensuring that its roads stay moving. Easing traffic congestion is therefore one of the main priorities for the **Conseil Exécutif des Transports Urbains Durables (CETUD)**, as it aims to give residents of the Senegalese capital access to safe, dependable and affordable public transport.

The Bus Rapid Transit (BRT) system provides mobility for approximately 320,000 daily commuters and gives the residents of Dakar dramatically improved access to jobs, healthcare and education. By providing a practical, affordable alternative to private vehicle use, CETUD aims to ease pressures on the city's roads, while reducing the volume of

greenhouse gasses being pumped into the air. In 2023, it was able to further advance this goal as it secured funding for the first ever electric BRT bus system in sub-Saharan Africa.

> "The open standards upon which Calypso technology are built is key to integrating new mass transportation offers such as the BRT, together with traditional Senegalese forms of artisanal transport such as mini-buses and other privately operated vehicles, helping to create a safe, professionalized and accessible urban mobility offer."

Thierno Birahim Aw,
General Director of CETUD in Senegal

Spotlight — hoplink

Hoplink is based on Calypso ticketing technology to create a robust, effective solution for interoperability between networks. The service allows customers to travel seamlessly locally, nationally and internationally, by merging all of their tickets and travel cards into one single card or app. It is designed to allow interoperability between networks.

With Hoplink, a transport operator can host new ticketing contracts on their Calypso-based cards, and Calypso HCE mobile tickets with the Host Card Interoperability Application, from other operators, adhering to the same rules. This allows passengers travelling across different transport networks to have a single solution for all their transport needs, which could also include parking or access control.

Fundamentally, Hoplink gives greater flexibility to transport and mobility networks, simply and conveniently, while maintaining system control.

Interparking

for Electric vehicles (EVs)

AT A GLANCE:

📍 1,001 sites across Europe

👤 123 million annual customers

Calypso solutions deployed:
- Calypso Prime
- Hoplink

Interparking

For more than sixty years, Interparking has provided high-quality and secure parking facilities for European travellers.

Today, Interparking is at the forefront of enabling true Mobility as a Service for commuters. Based on Calypso technology, Interparking's **Pcard+** gives customers access to parking payment, electric vehicle recharging facilities, carwashes, and multiple forms of transport associated with Belgium's Mobib service. Interparking is also a member of the Hoplink Alliance, providing interoperable ticketing throughout multiple cities and networks. Throughout Europe, Interparking serves as a model for the possibilities that come with the deployment of truly interoperable standards and solutions.

Accelerating Demand for EV Charging

Electric vehicles are an increasingly common sight around the world. However, many cities simply do not have the infrastructure to support the unique needs of these vehicles. While traditional refuelling stations can be found every few miles along main roads, the necessary connectors, cables, power banks and adaptors required to recharge an electric vehicle are far less widely available.

While dedicated EV home chargers are increasingly affordable and simple to install, to make such vehicles a truly viable replacement for vehicles that use fossil fuels, rapid charging needs to be readily available when travelling away from home.

Interparking is able to fulfil this need for millions of travellers, with over 1,000 facilities across Europe. By providing a secure, affordable way to charge a vehicle away from the home, Interparking is helping create the ecosystem needed for more sustainable private mobility solutions.

Using Calypso® to Enhance EV Charging Availability

To achieve near ubiquity for electric vehicle charging, creating an interoperable network is essential. Based on Calypso technology, Interparking's PCard allows for seamless interaction with smart card application protocol data units. This means that its EV platform is able to communicate with the European EV recharging network using tokenized RFID, and therefore provides users with roaming capabilities for all charging points.

Throughout the European Union, there is an obligation to provide options for ad-hoc payments without the need for a charging card. Calypso for Mobile engenders web or app-based solutions that provide Interparking customers with the payment options they need, while avoiding the additional transaction fees typically associated with open loop payments from the card schemes. This allows Interparking to retain total control over the value chain.

Lisbon

Authority:

transportes
metropolitanos
de lisboa

Operators (+20), including:

carris

Metropolitano de Lisboa

AT A GLANCE:

↗ More than 3,000 square kilometres

👤 Home to nearly 3.5 million people

🧴 Five million daily journeys

🚉 55 metro stations

⚙ 16 transport operators

🏛 18 municipalities

Residents of Lisbon rely on a complex network of many different modes of transport, including trams, buses, elevators, metro rail, and even a funicular, to move around the capital region. To support over three thousand different tariffs across different transport types, Lisbon needed an adaptable ticketing solution to enable seamless travel across all twenty-two operators.

The region's authority, **Transportes Metropolitanos de Lisboa (TML)** operates the VIVA solution, which is dedicated to developing, implementing, and managing new technologies for contactless multi-modal ticketing. In 2018, TML launched **VIVA Kiosk**, which allows travellers to request and receive within one minute a Calypso smartcard for use across Lisbon public transport networks.

Calypso solutions deployed:

· Calypso Prime
· ABT

Multiservice offering supported:

🚲 Bicycle sharing

🚗 Bike parks

🛵 Scooter sharing

🅿 Parking

Calypso Prime has enabled TML to create a single ticketing platform that unites and integrates transport and mobility operators from across the region, ensuring a consistent ticketing experience from twenty-two companies across transport, parking, and multi-service operators.

« The transport system of Lisbon and the whole metropolitan region serves 3.5 million inhabitants and is very complex. We needed a contactless system to adapt to many contexts. This would be very difficult without Calypso, which really facilitates our work. Now the ticketing system is not only for the Lisbon region. It goes further to incorporate 22 different transport companies and multiservice operators. »

Sonia Alegre
Administrator, TML

Lisbon (Ponto Navegante)

What is the Ponto Navegante?

The Ponto navegante launched in November 2021 is a service that allows the user to request and receive, in a few minutes, a Calypso smartcard to use in all public transports of 18 municipalities.

Additionally, this service also serves as a point of sale for loading and reloading of transport products. The challenge for TML was to facilitate the access to transport, promoting a self-service access, without the need to submit requests and without waiting in line.

This new service was developed with a completely new interface focused on user experience and does not require user training and it's accessible to a broad target of customers.

This service is also inclusive as it is adapted to reduced mobility and to people who have any degree of color blindness.

How did it begin?

The project began with a development made and implemented in 2018 by Otlis who designed 7 similar equipment's.

With the integration of Otlis into TML, this project was redesigned and implemented from scratch with new features such as the possibility of contactless payment, the possibility of loading occasional cards and new features that allow for greater inclusion and user experience.

Today, all municipalities in the Lisbon metropolitan area have this equipment that provides a service for requesting and issuing Calypso smartcards that was created, based on the CNA Remote loading specification, and adapted to remote issuing, using the Calypso keys stored in a Hard Security Module (HSM). Whit this change, the Ponto navegante can be used to issue and load the Calypso card, delivering them in under 2 or 3 minutes. The user can provide the required information by inserting the citizen card to request, pay and produce a Calypso smartcard.

If the client already exists in the system, he may also request a new card by validating his current data in the system's database and completing the request for a Calypso smartcard without using a citizen card. The Ponto navegante is also able to read and reload smart tickets used for occasional users.

Mexico
city

Operators:

STC (Metro), Metrobus, RTP, RTE, Ecobici
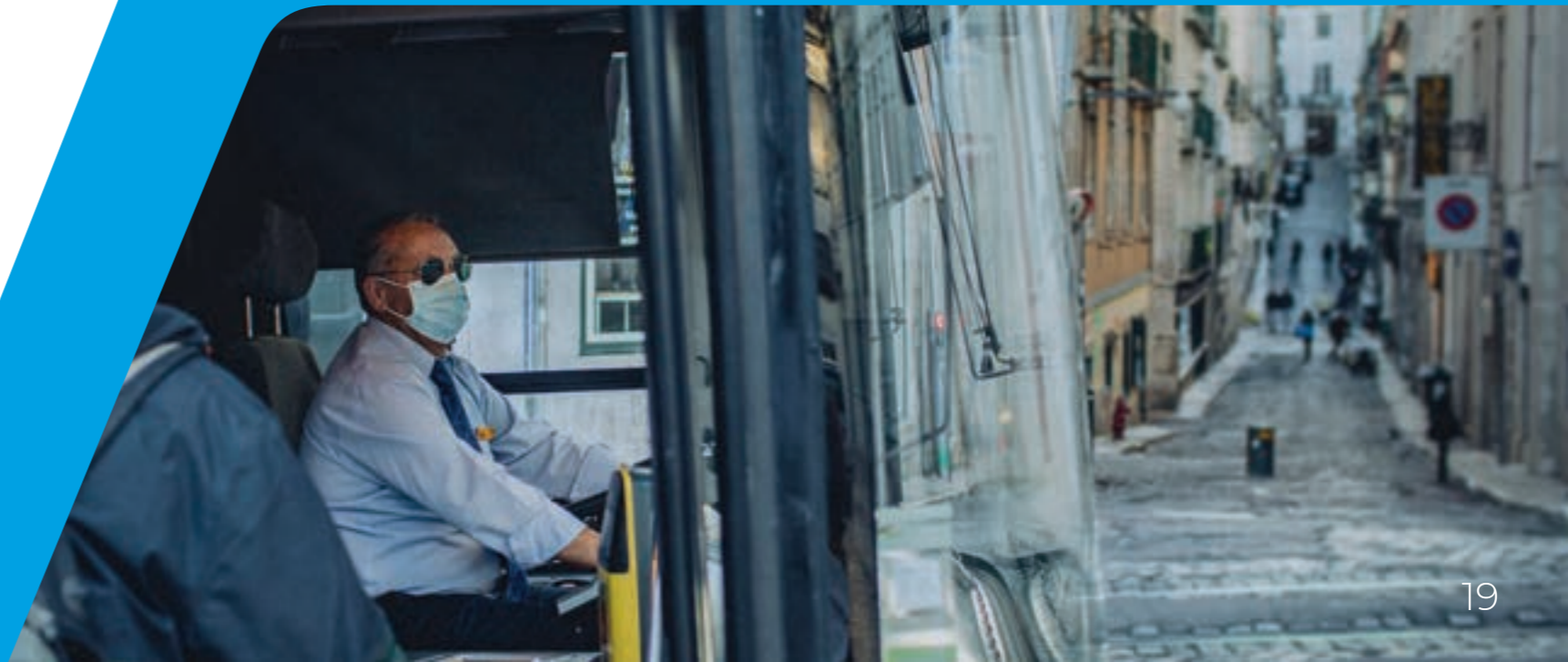
Authority:

AT A GLANCE:

↗ Covers nearly 8,000 square kilometres

👤 Home to 22 million people in the greater metropolitan area

🧳 Over five million daily journeys

🚋 12 metro lines

🚈 One light railway

🚌 Nine trolleybus lines, seven Metrobús lines, various microbuses and colectivos

🚲 Ecobici bike share stations

🚗 Car share & scooter share

🚎 One Cablebùs line

A true megacity, Mexico City relies on one of the world's largest and busiest public transport networks to carry millions of workers, students, and tourists and power its economy. **SEMOVI**, the public transport authority, relies on five different operators to run the network. The **Tarjeta Única de Movilidad Integrada**, a unique integrated smartcard, provides passengers with access to the network.

Like most urban areas, Mexico City has made combatting fraud and ensuring trust a top priority. Deploying **Calypso Prime** as

Calypso solutions deployed:

· Calypso Prime

Multiservice offering supported:

🚲 Bicycle sharing (ecobici)

the foundation for the **Tarjeta Única de Movilidad Integrada** has allowed Mexico City to create a contactless ticketing solution with built-in security. Additionally, the reusable and reloadable cards make ticketing more sustainable and lower overall costs.

Since transitioning to Calypso Prime, it is much more difficult for fraudsters to reproduce fake smartcards for use throughout Mexico City's public transport network. Social media sites no longer openly advertise the availability of fake smartcards, returning revenue to the system.

Since Calypso's commitment to open standards has eliminated the risk of vendor lock-in, the ticketing system procurement process has become more transparent and competitive, restoring public trust, and enabling better resilience and flexibility for the future. City planners are also using movement data collected from Tarjeta Única de Movilidad Integrada ticketing infrastructure to make informed decisions based on passenger behaviours to plan network upgrades.

Spotlight — Calypso PRIME

The advanced card in the Calypso range, Calypso Prime is based on open standards created by the transport community, for the transport community, It is designed for interoperability and can also be hosted on smartphones. Features include:

· Ticketing across a wide range of platforms and environments, including multi-application and mobile.
· Supports an account-based ticketing scheme.
· Provides cross network and cross-border interoperability.
· Stores several contracts / different ticketing options.

"Mexico City is a proud example of how urban transit can implement upgrades that guarantee long-term sustainability. The city has generated newfound levels of trust in contactless ticketing and optimism about its ability to integrate this with new and innovative public services. As the city's network expands, there is huge potential for Mexico City to help inspire best practices for other networks to replicate around the world."

Álvaro Madrigal Montes de Oca
General Director of the Coordination of Public Organizations and Strategic Projects, Mexico City

Milan

Authority:

Comune di Milano

Operators:

ATM

AT A GLANCE:

- Home to over three million people
- Approximately 880,000 daily commuters using public transport
- Five subway lines
- 19 tram lines
- 161 bus lines

The second most populous city in Italy and the regional capital of the Lombardy region, Milan is known as a global capital of fashion and design.

To serve the needs of its citizens and the millions of tourists who pass through the city each year, the **Milan Public Transport Network** has developed an extensive network of subway, tram, and bus lines. The system is based on **Calypso's contactless smartcard solution and NFC virtualisation technology**, allowing Milan to offer a wide array of ticketing options to meet the needs of the city's residents and tourists.

Calypso solutions deployed:

- Calypso Prime
- Calypso Light
- HCE
- ABT

Spotlight — Calypso® HCE

Calypso HCE for mobile ticketing is a software-based approach that stores limited use secure credentials on any Android operated device. It offers the level of functionality of Calypso Prime, though it does require adaptations to the ticketing infrastructure to ensure security is maintained to the Calypso standard. CNA provides Calypso HCE specifications and guidelines to support the implementation of this solution in a ticketing infrastructure at the required level of security.

Testing, certification and evaluation are fundamental elements supporting the evolution of transport ticketing. Within the Calypso HCE implementation guidelines is a self-declared compliance procedure: the Calypso HCE Security Certification scheme. This reference framework has evolved to become a vital tool guiding ticketing developers to provide functional and secure solutions alongside harmonising HCE solutions already live in the field.

"In Milan, people rely on underground and overground transportation to reach their destination. Deploying Calypso solutions allows us to provide convenient and easily accessible ticketing that takes passengers where they need to go without adding complexity to our system."

Paolo Ferrara,
CIO, Azienda Trasporti Milanesi

Montreal
& Quebec

Authority:

ARTM
Autorité régionale
de transport métropolitain

Operators:

stm Société de transport de Laval RTC

RTL STL exo

AT A GLANCE:

👤 Home to nearly 6 million people

🚆 Four metro lines

🚌 220 bus stations

⚙️ 17 operators across the region

Among the most populous cities in Canada, Montreal and Quebec aims to provide seamless transport across the entire region. To make this a reality, the **Société de transport de Montréal (STM**) partnered with sixteen transport operators to create an interoperable ticketing solution.

Based on the **Calypso Prime** solution, the **OPUS** card boasts a circulation of 4.5 million cards in use across Montreal, Quebec City, and the greater Quebec Region. The card enables remote loading of funds to minimize contact points and streamline the flow of passengers through transport terminals.

As passenger needs and demands evolve and new ticketing technology emerges, STM is committed to continued innovation to serve the needs of passengers and operators across North America's third-largest transportation network.

Calypso solutions deployed:

• Calypso Prime

Multiservice offering supported:

🚲 Bicycle sharing   BIXI

🚗 Car sharing   communauto

Spotlight   Calypso APPLET

Calypso Applet uses an applet that is hosted in an embedded Secure Element (eSE) or SIM card located in a connected consumer device to fully emulate a Calypso card and offer the same level of functionality and security.

The applet is installed and managed using GlobalPlatform mechanisms. It is compatible with all operating systems, requires no adaptation of a Calypso ticketing infrastructure, and can also function when the mobile device is switched off or has no battery.
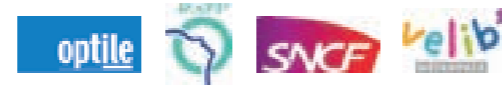
Paris

Authority:

![Île-de-France mobilités]

Operators :

![optile] ![RATP] ![SNCF] ![Vélib']

AT A GLANCE:

↗ Covers 12,000 km^2 around Paris

👤 Home to over 11 million people

🧳 4.5 billion public transport journeys annually

🚌 1,500 bus lines

🚇 14 metro lines

🚊 9 trams and 12 trains and commuter rail (Réseau Express Régional) line

📶 40,000 on-board devices

Île-de-France Mobilités (IDF-M) provides public transportation throughout Paris and the capital region. The constantly changing mobility needs of residents require IDF-M to operate the lines, maintain reliable schedules, and offer true Mobility as a Service. Coordinating ticketing solutions that enable seamless transitions between distinct transit operators presents considerable challenges.

For over 15 years, **Calypso Prime** has provided the foundation upon which IDF-M built the 'Navigo' transport pass, which enables highly secure and fast contactless transactions and cross-network interoperability. In 2019, IDF-M launched the Via Navigo mobile application using **Calypso for Mobile** and **Applet technology,** which allows passengers to purchase and validate fares with their smartphones. In 2021, IDF-M made hassle-free travel even more accessible by announcing that fares for the network can be reloaded on an iPhone using Apple Pay.

Calypso solutions deployed:

- Calypso Prime
- Calypso Light
- HCE
- Applet
- ABT

Multiservice offering supported:

🚲 Bicycle sharing (Vélib')

Today, IDF-M passengers enjoy seamless, convenient access to the Paris bus and metro network thanks to Navigo and Calypso open standards. The success of the Navigo system is now supported by the PMB ticketing modernization project, managed by Île-de-France Mobilités, which includes the implementation of a central system covering the entire region, the renewal equipment across the existing transport networks, and supplying the Grand Paris Express project, entirely based on the range of Calypso products, cards and dematerialized solutions.

IDF-M also relies on open-source solutions based on Keyple, such as the creation of an application that allows ticketing inspectors to read Navigo cards using an NFC Android smartphone – a project that took less than one year thanks to the ease of use of the Keyple SDK.

In 2024, IDF-M launched Europe's first transport card fully accessible from the Apple Wallet, also making the pass available from the Samsung Wallet on Galaxy phones.

Spotlight 📱 Calypso® for mobile

Calypso for Mobile is an open, secure technical standard that enables innovative and sustainable mobile ticketing solutions. It allows travellers to order, buy and validate tickets using a connected consumer device, such as a smartphone or smartwatch. Benefits include:

- Consumer convenience, providing new, simple ways to purchase tickets.
- Enable remote ticket reloading and contactless access control.
- New opportunities to deliver innovative ticketing solutions, such as MaaS which enables a traveller to seamlessly combine transport services to support end-to-end journey requirements.
- Combine real-time transport information and data capture with ticketing capabilities.
- Reduce ticketing distribution costs and removal of paper and plastic tickets.
- Support new and real-time measures to fight ticketing fraud.

Ile-de-France Mobilités launched of a new electronic contactless ticketing solution in 2023, powered by Calypso Light and geared toward the more casual passenger. This new solution is integral to the city's ability to provide secure, reliable, and convenient ticketing at significantly lower costs. This proved a perfect solution for fans at the Paris 2024 Olympic and Paralympic Games, supported by mobile ticketing enabled by Calypso.

Piedmont
Region

Authority:

Operators:

AT A GLANCE:

⤢ An area of 25,400 km^2

👤 Home to nearly 4.4 million people

⚙️ Around 70 Public Transport Operators

🚌 3,400 buses, tram, and 1 metro line

🔋 2 million users

Calypso solutions deployed:

• Calypso Prime
• HCE
• ABT

Multiservice offering supported:

🚲 Bicycle sharing

Since 2009, the Piemonte Region (North-west Italy) has been managing the Biglietto Integrato Piemonte (BIP); the public transport e-ticketing system. Thanks to a contactless smart card, it allows citizens to access any public transport in any part of the region. The system is based on 'a single card to ride all transport modes' concept.

The aim was to relaunch the regional local public transport system by improving accessibility, knowledge, management and promotion. It is supported by a relevant info-mobility platform and uses a regional contactless electronic ticketing solution relying on Calypso Prime.

The regional government charged its "in-house" company 5T to design and implement the BIP system and its infrastructure. The company is in charge of hosting and managing the Regional

Service Centre. This centre oversees the global security, interoperability, independent public governance, monitoring and control of public transport and services for citizens. All public transport operators must be compliant to the BIP system. The system is based on smart card contactless RFID Calypso 3.1. 5T is responsible for supplying and testing all smart cards needed by all the companies active in Piedmont.

Today, all citizens in Piemonte have access to public transport services provided by different providers using the same BIP Card. In the future, the BIP ecosystem will evolve towards even more smart, innovative and flexible fare solutions, increasingly oriented towards pay-per-use, customer loyalty and full regional fare integration (App, ABT solutions, MaaS approach).

"Having the ability to use one ticketing card across the entire Piedmont region is a significant bonus for its citizens. We see reliable, seamless and interoperable ticketing as a key part of our vision for a smarter future for the region, and by being part of the Calypso community, we have a strong partner helping us realise this goal."

Massimo Cocozza
Business Unit Manager, 5T S.R.L

Rennes

Authority:

METROPOLE Rennes

Operators:

KEOLIS RENNES

AT A GLANCE:

👤 Home to 500,000 people

🧳 353,000 trips daily
& 88.4 million trips annually

🚈 55 metro trains

🚌 42 kilometres of bus lanes

🚲 First electric bike fleet in France

As the capital of Brittany, Rennes blends the old and the new, relying on a network of metro trains, bus lines and France's first electric bike fleet to power public transport for residents and tourists.

The **KorriGo Card**, issued by STAR, is a smartcard based on **Calypso Prime** that provides travellers with a public transport ticket that can be ordered or topped up online, promoting easy and convenient ticketing for passengers of all types.

The KorriGo Services card, developed in conjunction with the **Keyple** open-source toolkit, goes a step further, offering travellers access to a wide range of local services such as municipal swimming pools, libraries, and entertainment.

Calypso solutions deployed:

· Calypso Prime
· Multiservice AMC
· Hoplink

Spotlight ···· Multiservice AMC ··············

L'AMC (Application Multiservice for Citizens) is a French official AFNOR standard to describe the way to integrate a multi-service application in a Calypso card, in full compliance with the requirements of the GDPR. It describes different identifiers for different services proposed to citizens such as university card, access control, libraries, museums, swimming pools, events, etc. provided in the city.

Many French cities have deployed the AMC standard, and the KorriGo card in Rennes and Brittany is widely seen as one of the most successful deployments of this standard.

> Keyple has allowed Rennes to be at the forefront of innovation with the creation of the KorriGo Services card. It has made it simple to develop convenient public transport ticketing and to provide access to a range of services to our residents from the same card.
>
> **Matthieu Theurier**
> Vice President – Mobility and Transport, Rennes Metropole

SNCF

AT A GLANCE:

⚑ State-owned national rail system for France

↗ 35,000 kilometres of routes

🚋 14,000 trains operated daily

Calypso solutions deployed:

- Calypso Prime
- Hoplink
- HCE
- ABT
- Applet

Multiservice offering supported:

🖨 Employee photocopiers

👫 Public toilets

Since 1938, SNCF has operated France's high-speed rail network, including the famous Orient Express. SNCF first implemented a **Calypso**-based ticket solution two decades ago, allowing passengers to enjoy multi-modal travel from a single smartcard. Since the rail system operates across different regions of France and relies on multiple independent operators, interoperability is imperative.

Recently, SNCF has transitioned toward a more centralised sales system that consolidates multiple sales channels, including mobile, vending machines, kiosks, counter sales, and high street retailers. To maintain security and interoperability across these channels, SNCF has deployed **Keyple** to harmonise the terminals.

SNCF continues to rely on Calypso solutions to fulfil its mission to optimise the cost and overall impact of transport for customers and for French taxpayers. Calypso's dedication to innovation supports SNCF infrastructures and services that are built for the long term and function as a shared asset for meeting social, ecological, and economic challenges and working for a dynamic, caring, and sustainable society.

> "The openness and scalability of Calypso was essential in allowing us to independently develop our ticketing offering and benefit from a choice between several different card suppliers. Also, the interoperability of Calypso means it is now the core ticketing standard for 99% of the French public transit networks."

Joël Eppe
Director of Ticketing, SNCF

Spotlight — Calypso LIGHT

Calypso Light provides an ideal solution for cost-effective contactless cards. It meets the needs of occasional travellers and account-based ticketing. Benefits include:

- Focuses on transport, but also accommodates ticketing for events, and access control – perfect for occasional travellers.
- Provides the same security level as Calypso Prime.
- Supports an account-based ticketing scheme.
- Has lower maintenance costs than magnetic stripe cards.
- Supports multiple flexible ticketing arrangements from the same operator.

SNCF & Eclipse Keyple

SNCF Voyageurs, the ticketing subsidiary of SNCF Group, has long been an innovator in the transit ticketing space, providing the right mobility offer for both the long-distance traveller and the everyday round-trip commuter.

Several years ago, the group began to develop BOX; its integrated multi-platform ticketing solution that allowed SNCF to standardise the services provided to applications deployed in all types of control, validation and distribution equipment. To further enhance BOX, SNCF Voyagers turned to Eclipse Keyple to achieve the next generation of door-to-door mobility solutions that meet passenger needs in terms of offer, cost, service quality and environmental sustainability.

Eclipse Keyple gives SNCF more control of its ticketing system, rather than leaving it at the mercy of proprietary vendors, and further facilitates interoperability between different systems and equipment. Thanks to **the flexibility and independence of the open-source SDK**, Keyple could be implemented by multiple teams within SNCF, each of whom could adapt the tool to meet their unique needs.

Plugins developed specifically for each different use case can support the base abstraction layer, freeing a product developer from being tied to any one specific type of hardware. **This means that one generic software solution can be used regardless of the equipment provider**, eliminating the need to adapt on-board software to meet unique proprietary needs, while ensuring native compatibility with the latest developments to the Calypso Standard.

The flexibility and independence provided by Eclipse Keyple means that SNCF can take back more control over its ticketing system rather than relying on proprietary vendors. SNCF can create an interoperable, inclusive ticketing offer that gives passengers throughout France choice in how they travel and how they pay.

Strasbourg

Authority:
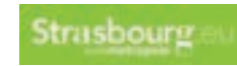
Strasbourg.eu

Operators:

CTS

AT A GLANCE:

↗ Official Seat of the European Parliament

👤 Home to more than 500,000 residents

🚌 36 bus lines

🚋 Six tram lines

As the official seat of the European Parliament, the Strasbourg metropolitan area serves as an international crossroads and busy transportation hub. When public health concerns brought the need for contactless ticketing solutions to the forefront, **Compagnie des Transports Strasbourgeois (CTS)** acted quickly to meet the challenge and provide a future-proof solution and address pandemic-related public health concerns.

Since nearly 75% of French smartphone users have an Android phone, CTS **became one of the first mobility operators to deploy Calypso's Host Card Application (HCE) for Android**. And today, Android users in Strasbourg enjoy access to mobile ticketing services via their NFC smartphones, enabling wider adoption of newer mobility services, including multiservice transport and even automobile parking access. It is a service that is particularly well accepted by CTS users, facilitating access to the various means of transport.

Calypso solutions deployed:

- HCE
- Applet
- ABT
- Hoplink
- Keyple

The CTS was also one of the first French networks to implement Hoplink on all its equipment, in sales and validation. This allows interoperability not only locally with regional train services (TER), but also for travelers coming from other regions or countries, as long as they carry a transport card containing the Hoplink application. Moreover, passengers in Strasbourg and from other networks and cities that have the Hoplink scheme can buy and load tickets on their cards remotely with their own device.

> "With our mobile ticketing solution, we can offer more customers a simple and secure solution for purchasing our entire fare range, wherever an internet connection is possible. This puts CTS at the forefront of innovation for travellers and visitors to the Strasbourg Eurométropole will benefit from a simple, useful, and secure mobile service thanks to the open Calypso standard."

Alain Caffart
Directeur de la Transformation Numérique, CTS
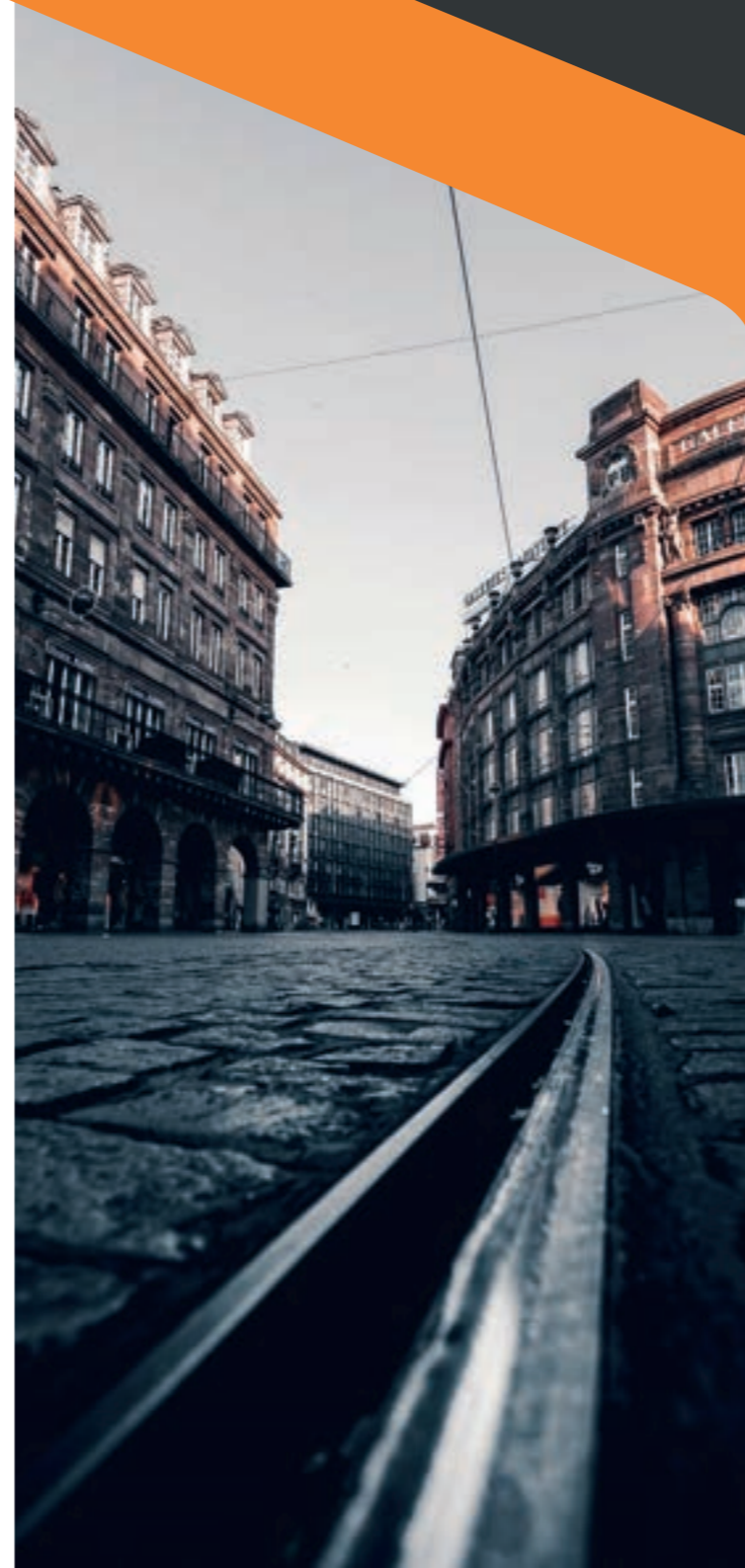
Spotlight 🔲 keyple

Eclipse Keyple is an open source, free-to-use Software Development Kit (SDK) for developers in the ticketing community. It's used as a framework for innovation, creation and delivery of advanced contactless ticketing solutions for use in terminals.

Fully open, dynamic, Calypso compliant, and readily accessible, Keyple enables cost-effective development of advanced ticketing systems similar to 'plug-and-play', which communicate with NFC fare media such as smartcards, smartphones, or wearables, and operating within several operating systems. It supports developers regardless of their experience or status, whether they are seasoned players or relatively new entrants to the transport ticketing sector.

As an open source solution, Keyple ensures transport operators and authorities have easy and cost-effective access to advanced, compliant smart ticketing software to help them evolve freely and implement their software modifications without relying on their existing hardware provider.

Spotlight keypop 🔲

To make it easier to certify terminals on the basis of standard interfaces, whatever the software implementation, the interface software has now been separated from the core Keyple software and is the subject of a new open-source project called Eclipse Keypop.

As a result, it is now possible to certify terminals at both card reader and Calypso transaction level, either using the Keyple SDK, or using a software implementation other than Keyple.

This guarantees even greater openness as, even though Keyple is an open-source implementation, CNA did not want to impose its use.

Venice

Authority:

CITTÀ DI VENEZIA

Operators:

Actv

AT A GLANCE:

👤 Home to nearly 275,000 residents

🧴 Millions of tourists visit each year

🚢 159 types of watercraft

≋ 120 floating stations

⚓ 30 lines

🅿 Parking facilities for commuters and tourists

The only city of its kind in the world, Venice is surrounded and crossed by waterways and canals, creating a floating network of small islands connected by bridges. **AVM/Actv** serves as the main public transport provider for the floating city, as well as for the suburban areas surrounding Padua, Treviso and Rovigo.

Since travel within Venice must be done by foot or by boat, the city requires a ticketing solution that enables both daily commuter passengers and tourists to transfer seamlessly between types of watercrafts, as well as to access parking facilities for automobiles outside the city limits.

Calypso solutions deployed:

· Calypso Prime
· HCE
· Applet
· ABT

Calypso Prime supports the **Venezia Unica City Pass**, an all-in-one pass that combines ticketing for different modes of public transportation within the city with admission to tourist attractions and cultural events and services useful to commuters and tourists alike.

"The security, flexibility, and innovation of Calypso solutions allows us to meet the unique ticketing challenges we face accommodating both daily commuters and millions of tourists each year, providing access to many types of public transport and services without adding additional complexity."

Gianluca Cuzzolin
Chief Operating Officer, AVM/Actv

Spotlight Calypso Account Based Ticketing (ABT)

Calypso Account Based Ticketing (ABT) enables transport operators to deploy ticketing systems that rely less on "card-centric" solutions – where data is stored in portable objects and managed by terminals – in favour of "server-centric" solutions where data is stored and managed in a remote data centre. Benefits of ABT include:

· Improved customer experience by providing pay-as-you-go fares
· Reduced operational costs, less complexity and reliance on hardware, enabled by moving to a centralised system
· Greater insights, flexibility and control for public transport operators
· Easier integration with MaaS systems
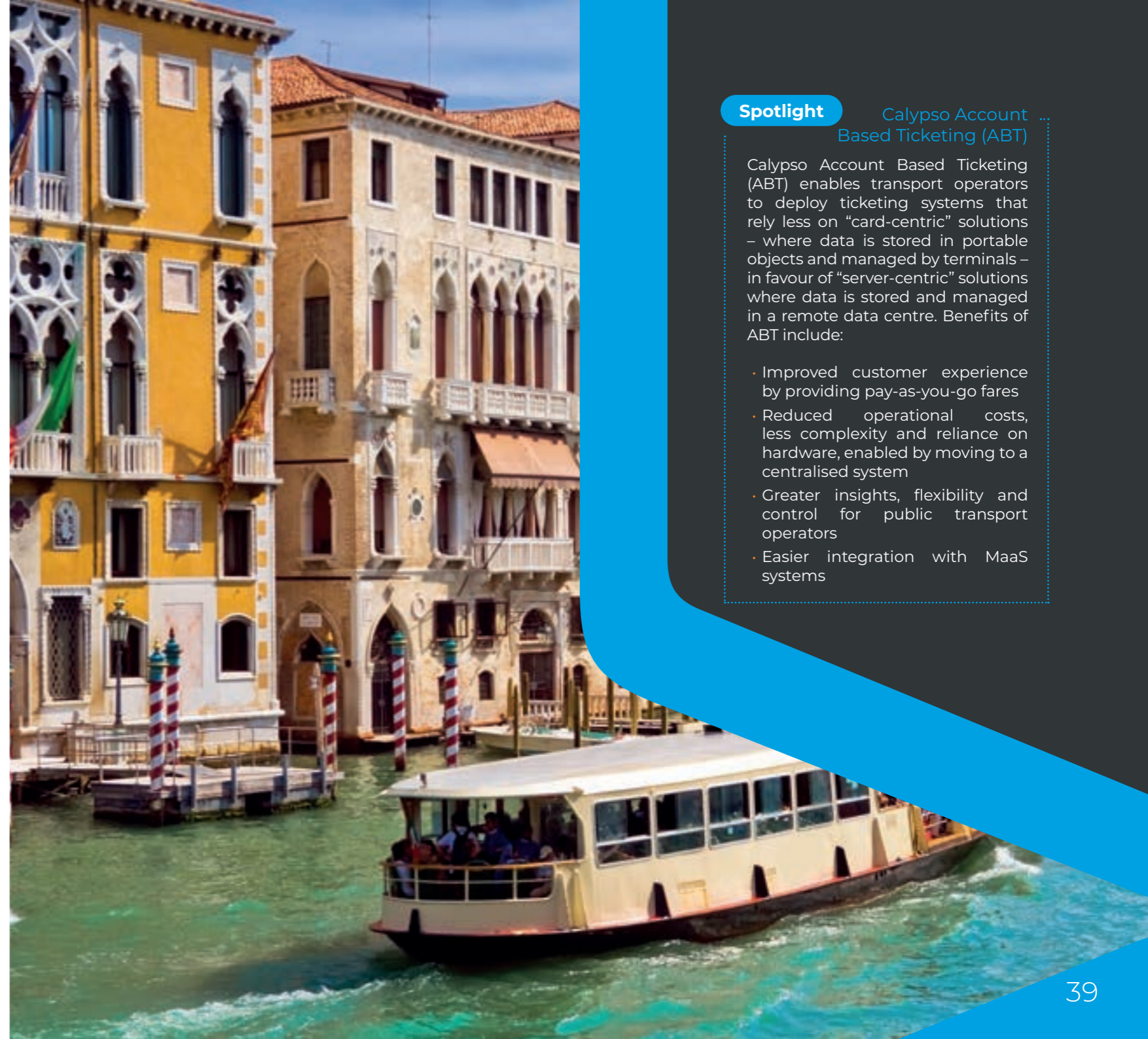
Calypso®

25+ YEARS OF TRANSPORT TICKETING INNOVATION

1996

Launch of the ICARE project, financed by the European Community, to develop a contactless ticketing system for multimodal and multi-operator public transport environments

This is followed by the Calypso project launching transport ticketing and multiservice payment applications in five initial locations: Paris, Lisbon, Venice, Brussels and Konstanz

1999

Two first in-field deployments of contactless ticketing systems based on Calypso launch in two French cities, Nice and Amiens

2000

Session and Ratification Patents Registration, forming the heart of Calypso's technology

Launch of the TRIANGLE project, precursor to Hoplink, to develop interoperability between European metropolitan areas, piloted on the Brussels-London-Paris triangle

2003

Creation of Calypso Networks Association, an ASBL (not-for-profit) under Belgium law

2016

CNA reaches 50 members

2014

First delivery of a compliance certificate for Calypso Prime cards

2012

Creation of Calypso's interoperable ticketing service, Hoplink

hoplink

2009

First prototype Calypso transaction from a mobile phone NFC SIM card

2006

First reload of Calypso cards on bank ATMs takes place in Lisbon, Portugal
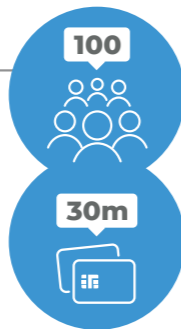
2017

Setup of a permanent, dedicated CNA team, to better answer to the needs of the transport ticketing community

2019

Setup of the Calypso brand license, based on mandatory certification of products compliant to Calypso specifications

CNA reaches 100 members and ships 30 million cards over the year

2020

More than 40 certified Prime, Light cards and a certified Prime applet on Secure Elements or Javacards

2021

Calypso definitively enters the open-source world with the issuance of the Eclipse Keyple API and software 2.0 for terminals

Calypso enhances the security of mobile ticketing on Android devices, officially launching the Calypso HCE Security Certification (CHSC) scheme
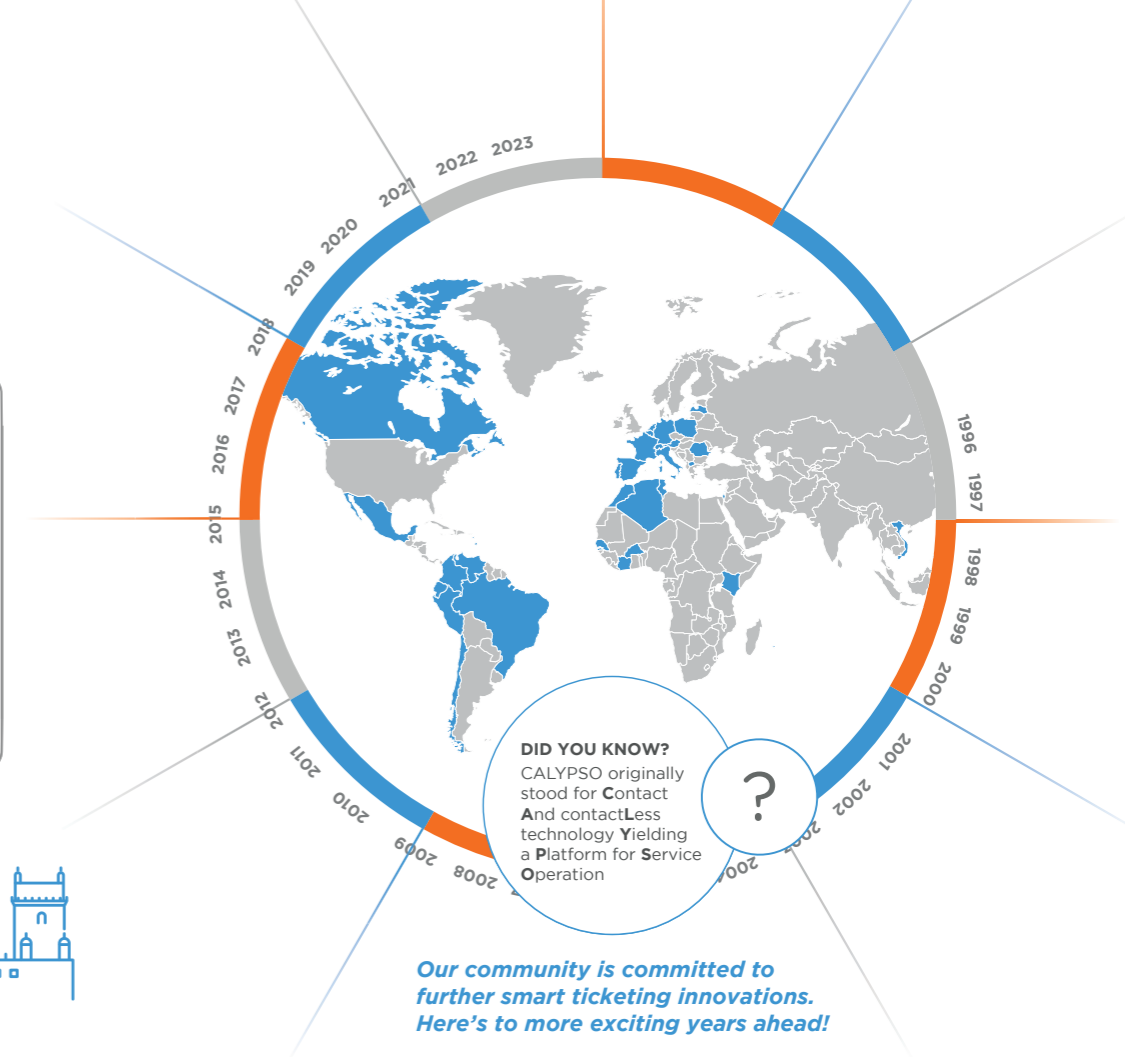
2022

Launch of Calypso Basic for a highly secure and low-cost contactless ticketing experience

2023

CNA celebrated its 20th anniversary

Calypso 20 years

DID YOU KNOW?
CALYPSO originally stood for **C**ontact **A**nd contact**L**ess technology **Y**ielding a **P**latform for **S**ervice **O**peration

Our community is committed to further smart ticketing innovations. Here's to more exciting years ahead!

Journey with Calypso

For more than 25 years, members of the global transport and mobility community have trusted Calypso to help them overcome challenges. From the early days, when a group of transport operators and authorities from Belgium, France, Germany, Italy, and Portugal joined forces to develop a better contactless pass solution, to creating smart ticketing solutions to meet the demands of today's passengers worldwide, Calypso Networks Association continues to define the future of transport ticketing.

To learn more about how Calypso's standards and solutions can help transform ticketing for your network or discover how you can take an active role in the organisation's work, please get in touch.

🔗 www.calypsonet.org

🔊 Read our blogs
@ Transport Ticketing Trends
www.calypsonet.org/transport-ticketing-trends/

🌐 https://calypsonet.org/about-calypso-networks-association-cna/

in Calypso Networks Association