Shifting The Ticketing Paradigm

CIPURSE™ Brings Mobility and Security to Transit Ticketing Systems
Executive Summary

Rising fuel costs, environmental concerns, and rapid population growth are trends converging on the world's transportation channels. Many transportation authorities are rethinking their strategies, especially in light of passengers' preferences for convenience and mobility. As a result, new business models are emerging—together with new opportunities.

The Open Standard for Public Transport (OSPT™) Alliance was founded to develop and promote the next generation of secure, cost-effective, and flexible fare collection solutions through a global, multi-provider community. The OSPT Alliance has developed the CIPURSE™ open security standard—an advanced foundation for developing highly secure, interoperable, and flexible transit fare collection solutions. Interest in this innovative open standard is driving rapid growth in OSPT Alliance membership. CIPURSE has gained widespread recognition among transit operators and authorities. And new products with CIPURSE certification are emerging on the market.

In the public transport world, the OSPT Alliance may be relatively new. However, its many members and ecosystem partners are not. Anyone in the transit ecosystem can join the OSPT Alliance and their contributions are valued. The synthesis of new ideas and viewpoints is creating dynamic discussion and momentum. This white paper, and future white papers to be released from OSPT Alliance, will examine the role of CIPURSE from two perspectives:

• **Business Executive Perspective:** All automated fare collection (AFC) solutions are used by public entities, which must attract—and retain—passengers. Therefore, daily commuters are strategic enablers for development of multiple applications and services. For this reason, AFC systems cannot be viewed simply as a commodity to be procured with the ability to perhaps someday accommodate a contactless secure transaction. They must be future-proofed: able to allow transit organizations to maximize on new opportunities as they arise. Today’s public transport ticketing capabilities can create a strong foundation for continuing integration between digital ecosystems, such as fare collection and payment; payment and loyalty; fare collection and security; and others. With a foundation based on the CIPURSE open standard, the AFC system can potentially benefit transit operators in many ways that were previously not possible.

• **Technology Executive Perspective:** Technology executives know all too well the perils of technology and system upgrades; the challenges of keeping pace with security needs; and the need to protect existing technology investments. The CIPURSE open standard is designed to give developers the most current security protection available, together with the flexibility of open standards. Products that are CIPURSE-certified can help the technology executive meet a diverse range of objectives, both today and tomorrow.

Deeper insights and perspectives on each viewpoint will be expanded in an upcoming series of papers and articles.

The State of AFC System Implementation

Public transport operators and authorities are increasingly being asked to deploy automated fare collection systems. The degree of automation and openness currently deployed varies greatly. Transit ticketing implementations can be grouped into one of the following four categories.

**Mandated Specification Implementations**

Some transportation operators have deployed national or regional schemes based on formal open specifications. Decisions for evolving these systems will require a national-level decision. Evolving this type of system will be easier in some ways but more difficult in others. Interoperability challenges should be minor, because interoperability issues were addressed by the nature of a nation-wide implementation. On the other hand, the sheer economic weight of a nation-wide solution can become the strongest deterrent to a fare collection system’s evolution. In all cases, such transportation networks require unique evolutionary approaches or massive reinvestments. Systems in this category include those of the U.K., Germany, The Netherlands, Hong Kong, and Singapore.

**Good-enough Proprietary Implementations**

Some transit authorities have implemented AFC solutions based on a proprietary solution. These systems are fast, secure, reliable, and convenient enough to maintain the current total cost of ownership for the next three to five years. These systems also provide enough protection for potential new private or public investments that are planned to connect public transport services with relevant emerging digital services. Japan and South Korea’s systems fall into this category.
Proprietary Implementations Needing Evolution
These are proprietary transit ticketing solutions that will require significant evolution due to the maturity of the implementations and their limitations. For example, the need to advance security to align with today’s standards, the unsustainable cost of ownership and restrictions created by vendor lock-in. Not only will these limitations constrain a proper public transport policy implementation, but they also deter new investments which will offer ultimate user convenience and seize the value of transport as the most proven ‘top-of-the-wallet’ application.

Manual Systems
These systems lack an automated fare collection system.

Based on our current research, 95% of cities today are using proprietary and manual implementations. This white paper will address the benefits of evolving existing systems or integrating complementary and new technologies to migrate away from proprietary solutions to an open standards ecosystem. In particular, the paper will highlight that AFC systems should be viewed as an ‘asset’ that can attract private / public investments, rather than a procurement cost.

Evolving AFC Systems: The Options
Public transport operators and authorities have several options when considering fare collection systems evolution. These options range from developing their own solutions to complete system migration. We offer the following perspectives to provide guidance.

Innovation at the Point of Contact
Contactless secure communication, AFC, and purse-based micropayment technologies are not really new. They have evolved slowly over several decades and are in their current state because there were no open standards until recently. The growing pervasiveness of digital services, such as eWallets, information, communications, and rights to travel, are driving the emergence of new business models. Whether delivered over the Internet, mobile networks, or between individual devices, these services are interoperable. And as a result, they can reach everyone, including people with no banking relationship.

Today, AFC systems have the potential to become the contactless killer application, enabling new business models. However, just like mobile operators take losses on short calls for the opportunity to generate revenue from other value-added mobile services, transit investors must be prepared to invest in services and infrastructure that allow interoperability while encouraging consumer loyalty. Automated fare collection, based on the CIPURSE open standard, promises precisely that. Transit operators and authorities can protect their existing infrastructure investments while evolving to interconnect digital consumer channels. This opportunity promises to achieve what was started 30 years ago with purse-based attempts to replace cash.

Innovation led by Public-Private Partnerships
Automated Fare Collection innovation may also occur as the condition for successful Public-Private Partnerships (PPPs). Successful transport PPP projects have multiplied in the past few years. As a consequence, participants are applying procurement best practices such as return on investment (ROI)- driven projects, total cost of ownership optimization, multi-sourcing, and independence from a single supplier. These practices are rapidly becoming the norm.

Participating non-transport private players understand the value of public transport as a single point of access to captive consumer communities. Regulations—or the lack of them—are creating unique new business opportunities. Transport authorities benefit because they earn a concession, instead of having to pay for system procurement. In a PPP context, private investors are usually not willing to make investments in which returns are dependent on a proprietary solution.

Lessons learned from PPPs can benefit countries with a long history of public-funded fare collection systems—especially as public moneys become harder to source. In emerging markets, rapidly growing populations are forcing regulators to innovate and open up fare collection card issuance to non-transport applications. The resulting innovation has boosted ROI by incredible amounts. And it has accelerated deployment three to five times faster than previously.

Although PPP may not be the right model for every region, it does deliver an objective reality check. PPP advances can foster publicly funded programs that incorporate innovation made possible by the CIPURSE open standard.
Integration. Instead of Migration.

The introduction of an open platform such as CIPURSE, together with standard(s) already in place, is the safest option. Before the CIPURSE open standard was available, multivendor implementations were attempted without much success. With limited—if any interoperability, these solutions required operators to support multiple technological specifications with limited hardware resources. Integration attempts also created unforeseen difficulties with proprietary systems across tiers.

Events that compromised security in proprietary technologies have effectively prevented operators from getting more out of their existing ticketing systems. Although the fraud is not damaging enough to justify a migration to a new standard, it is significant enough to prevent expanding ticketing solutions to non-transport business models. In these cases, a legacy deployment can coexist with a CIPURSE-certified solution. As a hardware-agnostic open standard, CIPURSE enables such coexistence.

The CIPURSE standard is truly open. It does not discriminate against any system player. As a result, innovative approaches are emerging to solve interoperability challenges. This innovation supports interoperability of a legacy fare collection application with CIPURSE, and it enables bespoke business models to be tailored to the local realities of a specific program.

With CIPURSE as a truly open standard, no single solution provider will provide a monopoly on the entire fare collection market. Regions are designing implementations that best fit their particular market segments. For example, CIPURSE can coexist with U.S. EMV open-loop bank-issued cards. It can work with Asian purse-only closed-loop cobranded cards. And its flexibility supports a wide range of variants in Latin American countries where 85% of the population is unbanked.

Compatibility with card readers is also simpler. The cost of a standards-based, CIPURSE-compliant card platform is not significantly different from the introduction of a single card platform. There is no hardware modification required, as long as the contactless reader is compliant with ISO 14443.

Why Consider CIPURSE?

In every other area of technology, the introduction of open standards and resulting open solutions has spawned innovation and new opportunities. For example, the Internet Protocol (IP) standard replaced multiple other network transport protocols and launched massive growth in networking capabilities. There is growing consensus among program owners that fare collection technology is now mature enough to not have to rely on a single solution provider. An open standard simplifies connections between service providers, because service interoperability is enabled at the application level, not at the platform level.

The OSPT Alliance’s membership is a strong factor in making CIPURSE a viable open standard. The industry leaders that founded the OSPT Alliance make it possible to attract private investment, form new business models, and confidently develop innovative services. Members from around the world and across the transit ecosystem bring diverse perspectives and the strength of real-world experience. As a result, the CIPURSE open standard offers greater robustness and flexibility—because it must, if it is to work effectively.

As a chip-agnostic solution, CIPURSE opens up options for card acceptance. Local markets can drive program evolution depending on the value brought by each proposition. Accepting a multiple options path is also more cost-effective. The ability to use “chip A” based closed-loop CIPURSE; “chip B” based open-loop EMV; “chip C” account-based token; or “chip D” for any combination of the previous, allows program owners to source the right model mix for their local ecosystems. This is far more cost-effective than having to specify and deploy an application across tiers of proprietary technology.

The CIPURSE specification also delivers unprecedented scalability. The limited-use ticket, the mid-range, and the high-end products all use a common command-set and security framework, which facilitates introduction of new products and avoids costly and complex system modifications. Furthermore, thanks to compatibility between these profiles, operators can introduce complementary services. For example, ticketing could also support access control to a stadium, car park ticketing, bike rental, and other services. All at virtually no extra cost.
Integrating CIPURSE-based solutions will be greatly simplified and faster. For example, any ISO 14443-compliant card reader can accommodate a CIPURSE solution by upgrading to ISO 14443-4 and integrating a CIPURSE Secure Access Module (SAM) or CIPURSE functionality into the existing SAM or firmware.

Rather than considering fare collection card issuance as a cost of doing business, program owners can look at ticketing as an enabler of new revenue. The unique public transit user base already has connections to services that they value and are willing to try new services that are convenient, mobile, and innovative.

Roadblocks?
Adoption of open standards-based AFC systems are not hindered by technology or implementation concerns. In other technology markets dominated by proprietary systems for a long time, the primary roadblock was the lack of incentive for existing players to encourage change or competition. Now that CIPURSE is available and adoption is growing, current dominant players are paying more attention. The coming months will tell us how fast they are able to adapt.