

Pay as you like it

Chicago is the first big-city transit operator to open fare payment to the universe of payment methods

While most large U.S. transit systems already use contactless smart cards in their fare media mix, they are closed-loop systems, in which the agency issues and manages the cards themselves.

Open payment refers to accepting bank-issued contactless cards, offered by all the leading payment brands including American Express, Discover, MasterCard and Visa, as fare media directly at the turnstile, bus-fare box and elsewhere.

Once completed, riders will simply “tap” their card or mobile phone to pay for public transportation and other services. Riders will be able to choose from different contactless payment methods for paying fares, including personal bank-issued debit and credit cards and compatible-payments-enabled smart phones. In addition, the Chicago Transit Authority (CTA) will issue Ventra cards, a new dual-purpose card that includes a transit account and a prepaid debit account. The card can be used to pay for transit and everyday purchases, like shopping online or buying groceries, and for paying transit fares.

In this article we will discuss why Chicago and others are moving to open payments and key considerations on how they are getting there, including a look at the dynamic U.S. payments landscape.

Advancing toward open payment

The benefits of using contactless smart cards in the mass-transit marketplace are already well documented. Now changes taking place in the U.S. payments market have



One of the biggest steps in implementing open payments is upgrading the infrastructure to accept open transactions at the point of service, such as metro gates and buses.

created new options for agencies.

Since mid-2005, financial institutions have issued contactless cards and focused on capturing increased volumes of micropayments. In addition, an increasing number of merchants in a wide variety of categories now accept contactless payments.

Transit operators and payment providers both saw the opportunity to enhance customer convenience, transaction speed and data security while lowering the costs of fare management using bank-issued contactless cards.

To expand the contactless transaction market and improve the business case for transit, the payment brands have created special rules and practices, such as relaxing signature and receipt requirements and changing authorization and transaction aggregation rules that enable agencies and their partners to lower transaction-processing costs.

Technology advances also have been a factor. Fast transaction speeds are needed to maintain or even improve passenger boarding times. At the same time, further improving security and reducing fraud are essential goals. Advances in payment processing and increased transaction speeds at turnstiles and buses have produced open contactless-payment transactions that can comply with the demanding transit-payment requirements. The adoption by both industries of the ISO/IEC 14443 technology standard, which defines the interface between a contactless card and an electronic reader, provided an additional opportunity to link the two.

Against this backdrop, the open payment movement has garnered a great deal of interest in the transit industry, and for good reason. A white paper from the cross-industry Smart



The CTA was able to transfer the cost of fare-collection implementation and operation to Cubic and its partners, as well as shifting the risk of credit-card processing and security.

Card Alliance Transportation Council cites these benefits, among others:

- Lower fare-collection costs by reducing the costs of issuing fare media, handling cash and acquiring transactions;
- Lowering equipment costs by leveraging standards and systems developed and maintained for the financial-payment industry, including card technology, hardware and software;
- Better customer experience, because riders pay for transit like they pay for everything else, without having to purchase and fund a separate card;
- Improved customer service, since bank-issued cards bring with them the complete customer-support system, claim resolution process and protection against loss;
- Automatic interagency and intermodal support for all operators who accept open payment;
- Well-defined and globally accepted security for both contactless smart cards and payment-processing systems, which are obligated to comply with the Payment Card Industry Data Security Standards; and
- Opportunities for new revenue streams, including shared card revenues with issuers, transaction fees for agency-issued branded credit and debit cards, on-card advertising and expansion to other agencies.

Flexibility is a must

One of the biggest steps in implementing open payments is

upgrading the infrastructure to accept open transactions at the point of service, such as metro gates and buses. In making this change, agencies must plan ahead for flexibility by taking into account the roadmap for new types of payment technology coming from the financial-services industry, especially mobile payments and EMV.

Research and field trials have shown that the idea of being able to use your mobile phone as a payment device is very interesting to consumers. Merchants and issuers are attracted to mobile payments by the marketing opportunities it creates. Today there are several competing alternatives for mobile payment, but the approach favored by the payment brands and largest mobile operators is near field communications (NFC) contactless. NFC is a standards-based wireless-communication technology that allows data to be exchanged between devices that are a few centimeters apart. NFC operates at 13.56 MHz, transfers data at 424 Kbits per second and is compatible with contactless-payments-acceptance device standards. In addition to payments, NFC also can be used for mobile marketing, sharing and gathering information and storing other types of personal credentials.

A number of major stakeholders created Isis, a joint venture to advance mobile payment in the U.S. between AT&T Mobility, Verizon Wireless and T-Mobile USA. The group has signed up Visa, MasterCard, Discover and American Express to support NFC-based mobile payments. The Isis mobile

wallet is currently being tested in Austin and Salt Lake City.

Near-term benefits

The NFC contactless model for mobile payments has several advantages in security and other areas, but one big benefit is compatibility with open-contactless-acceptance devices. That means transit operators that move to open payment also are positioning themselves for mobile payment as envisioned by the payments industry. A transit rider with an NFC-enabled payment app on their phone could use their phone as a fare medium and pay just like they would with a contactless card.

Another consideration is that the U.S. is now migrating to the global EMV standard for all credit and debit cards. The EMV specifications, first available in 1996 and managed by EMVCo, define the global interoperable standard for smart-card-based bank cards and the accompanying point-of-sale infrastructure. Motivated by better security in the face of mounting fraud costs, most of the rest of the world has already moved to EMV. EMVCo estimates 45% of bank cards worldwide and 76% of acceptance devices are EMV-compliant, excluding the U.S.

While the U.S. migration roadmaps differ among the payment brands, in general merchants that have not implemented EMV-compatible payment systems by as early as 2014 will face a greater liability for fraud losses if an EMV chip card is used in the transaction.

An excellent organization to consider if you want to learn more is the EMV Migration Forum, an independent, cross-industry body created by the Smart Card Alliance to address issues that require broad cooperation and coordination across many constituents in the payments space to promote the efficient, timely and effective migration to EMV. A broad cross section of leading payments brands, issuers, payments processors and industry suppliers were behind establishing the forum.

The first impact of EMV migration is that all transit operators, whether they move to open payment or not, will have to upgrade their ticket and card vending and reloading machines, as well as all their payment terminals, to

support EMV chip-card transactions. The second impact is that eventually it is likely the U.S. contactless acceptance terminals will have to migrate to the EMV contactless standard, which is different. No mandates or roadmaps for this are in place today, but it is prudent to do what you can to prepare for this possibility.

Agencies considering the move to open payments need to make sure their implementation plans are positioning them for flexibility for these near- and longer-term considerations. One way to do this is to install card readers that can accept these different standards with only a software upgrade. As an example, the current Cubic Transportation Systems' Tri-Reader can work in closed-contactless, open-contactless and EMV environments. Many of Cubic's customers already have these card readers today in newer equipment, which reduces the cost and complexity of migrating to open payment.

Compliance in the back

An open-contactless-bank-card approach requires an account-based architecture, as compared to the traditional card-based architecture. Typically card-based architectures store value as money or ride units on the fare card itself. That is one of the reasons the transaction speeds are very fast.

An account-based architecture works more like a traditional credit- or debit-card-processing network. The terminal reads the card information, sends it to a back-office system that maintains the fare system's logic, determines whether the card is valid or not and returns a signal that enables the terminal to open the gate or to signal the rider and the bus operator whether to allow passage. The terminal may perform security functions, and it also can check a hot list or positive (cold) list to determine card validity before sending any payment data to the host. However, the card is typically only accessed with a read function by the terminal.

The back-office system uses the data sent by the terminal to apply the relevant business rules and determine a price for the transaction using the agency's fare policy/rules. Transaction types and payment methods can vary

with this architecture based on the transit agency's business rules and the types of technologies deployed.

Account-based architectures are necessary to implement open payment, but they have many other advantages. It enables transit agencies to incorporate any contactless smart card into their system as fare media by linking the card to a funding account. It makes it easier to implement changes to fare policies, since changes are made in the back-office system instead of the cards and terminals. Another benefit is that an account-based back-office system allows transit agencies to accept payment from eligible government benefits and pretax programs that issue contactless prepaid cards, such as Social Security; Temporary Assistance for Needy Families; Women, Infants and Children; state unemployment; and court-ordered payments.

It also is important to remember the back-office system must be compliant with financial services security mandates. In the case of the CTA, they chose to use Cubic Payment Application (CPA 3.0), a back-office system that has been certified as a Validated Payments Application by the PCI Security Standards Council, based on a successful assessment for compliance with the Payment Card Industry Data Security Standards.

Another advantage of CPA is that it can be used across multiple agencies for transaction processing, including not just public transit but also tolls on bridges and roadways or other government-run fee-collection systems. This can save implementation time and costs and potentially reduce transaction costs across a metro area or larger region.

An important implementation consideration is how to serve riders who lack a bank-issued payment card or account (i.e., customers who are "unbanked" or "underbanked"). These riders can be accommodated using contactless prepaid cards. The prepaid industry includes several types of cards that give agencies many options to tailor offers for different rider market segments.

New Jersey pioneers

The first test of this important capability was by the Port Authority Transit Corp. (PATCO), a local transit operator that runs from Camden

County, N.J., to Philadelphia. PATCO is a small single-line agency with only 13 stations on a 14.2-mile track and processes approximately 36,000 transactions daily, making it the perfect place to pilot new technology.

The agency conducted an open payment trial from September 2011 through October 2012, using PATCO-branded Wave & Pay Anywhere prepaid Visa debit cards. The Wave & Pay Anywhere Visa cards made PATCO the first open-payment system in the nation to incorporate a transit-agency-branded contactless prepaid card. The Wave & Pay Anywhere cards were usable at PATCO fare gates and parking as well as retail outlets and ATMs. Customers were able to reload their cards online from the pilot website and at station kiosks if they wanted to use cash. The introduction of the new payment card provided riders with the opportunity to experience the convenience and security of a contactless Visa-branded card.

Developed and funded by Cubic, the pilot program was established to help transit agencies facing shrinking budgets find new ways to reduce costs of fare-card operations, create avenues for additional revenues and offer increased customer convenience. The pilot confirmed the suitability and attractiveness of the general-purpose reloadable debit cards for riders and that



The first impact of EMV migration is that all transit operators will have to upgrade their vending and reloading machines.

consumers will indeed use the cards for both transit and retail purchases.

Partners pay off

The move to open payments creates new possibilities for public-private partnerships (P3s). Public-transportation projects are expensive, and with many operators facing shrinking budgets, it is becoming harder for them to fund projects that are needed to keep their systems running safely and efficiently.

P3s can make it possible for transit agencies to make these necessary changes without hiking fares and losing ridership. In a P3 agreement, projects are privately financed, while the transit agency can still maintain control of all or parts of the project, depending on the structure and terms. The private partner, or concessionaire, assumes part, if not all, of the financial risk in exchange for a potential share of the profits.

The city of Chicago and the CTA are leaders in the use of the P3 model for projects. The CTA entered into

a P3 with Cubic for their open-payment system. In a recent *Chicago Tribune* article, CTA President Forrest Claypool referred to the agreement as “a solid model for future CTA public-private partnerships.”

In this example, the CTA was able to transfer the cost of fare-collection systems implementation and operation to Cubic and its partners, as well as shifting the risk of credit-card processing and security. As the integrator, Cubic will operate and maintain the entire system. The payments under the contract will begin when the commercial service status of the system is achieved.

The CTA estimates the P3 model and the move to open payments will save the agency \$50 million over the next 12 years.

Summing up

The changes taking place in the U.S. payments industry—and the broader trends of ubiquitous mobile devices and network access for consumers—will have a significant impact on

transit-fare systems.

At a minimum, planning needs to take place for the migration to EMV-compliant systems. In addition, as many operators near the end of the useful life of their aging magnetic-stripe cards, it is a good time to consider embracing open payments.

As agencies look forward at this dynamic landscape, they also should remember the planning for these changes is a long process. The CTA team has said their planning and procurement process took about two years, and another two years plus to implement and transition.

Something to take comfort in is that since EMV is already in use in other countries, experienced partners have the know-how and equipment to help plan and implement the migration to open payment and ultimately EMV. **TM&E**

Cole is senior vice president, strategy and business development, at Cubic Transportation Systems, San Diego, Calif.; <http://cts.cubic.com>.

High-Speed Rail Update

Continued from p 10

spark transit-oriented development across the country. Where there is access to transportation, there is economic growth.

Something else to consider: A study conducted by the University of California Los Angeles and China's Tsinghua University suggested when second-tier cities, such as St. Louis, are linked by high-speed rail to global hubs, such as Chicago, people will migrate to the second-tier city, causing a housing boom.

In China, high-speed trains boosted market potential by 10% and housing pricings by 4.5%. Researchers believe the same could happen in the U.S. if high-speed rail connects smaller cities to larger ones.

Well on its way and not turning back

Constituents will see real high-speed rail progress—in terms of quality of life, job creation and economic growth—in the next three to five years



Unlike many airports, located miles from dense urban areas, train stations can be planted in the heart of a city's downtown, becoming magnets for commercial and residential development.

as the U.S. economy begins to turn around. Once Americans reap the benefits—instead of just hearing about them—the financial support necessary to move this new mode forward should come easier.

For now, although there is no clear path to a secure, sustainable funding

source, work is being done. As former U.S. Secretary of Transportation Ray LaHood said before he retired this past January, high-speed rail is “well on its way and not turning back.” **TM&E**

Gertler is chair of high-speed rail services at HNTB Corp.