PwC's Transit Payments Newsletter

July 2019

pwc

Foreword

Dear readers,

It is our pleasure to bring to you the latest edition of our Transit Payments newsletter, in which we explore the evolving trends in digital payments in the overall transit ecosystem, and the implications of this on various stakeholders.

We have also captured key innovations and the road ahead for transit payments which we believe will impact the ecosystem going forward.

We hope you will find this to be a good and insightful read.

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In this issue

The journey so far

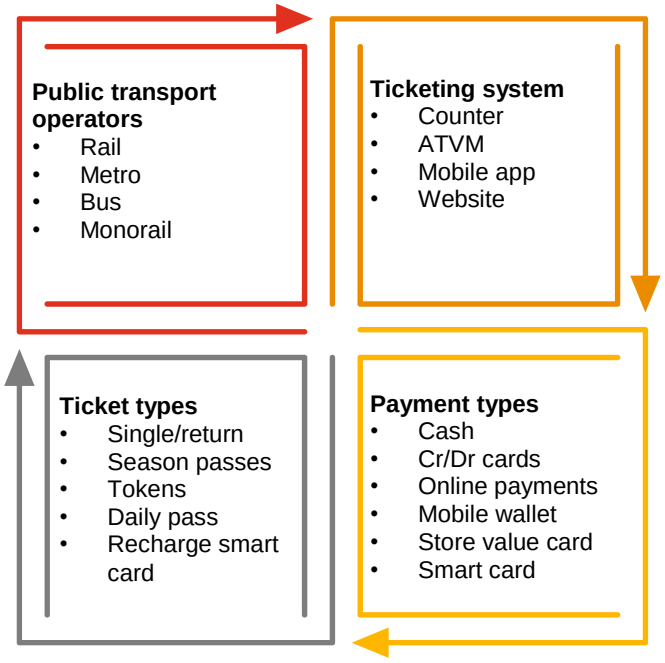
Rapid growth in India's urban population has put enormous pressure on all transport systems. Swift urbanisation is one of the megatrends identified by PwC in its report "Five megatrends and their implications for global defence & security". Since the urban population is far more dependent on public transport than rural India, the need for public transport services has increased faster than overall population growth. The requirement for efficient, commuter-friendly, multimodal and interoperable transit payments across the country for public buses, metros, monorails, ferries, railways and other modes of travel cannot be denied.

Faster, efficient and secure payments are critical for a widely-accepted transit ecosystem. The transit payments' space has evolved considerably from a closed-loop system to a full-fledged open-loop smart-card-based ecosystem, allowing the use of smart cards outside the transit landscape as well. The end objective is to make them fully interoperable across multiple use cases in a number of locations.

In an age where customer satisfaction is paramount, traditional fare collection methods are being revisited. Transit operators are taking steps to modernise the fare collection systems and offer multiple payment options to the commuters. The proposed upgrades seek to reduce cash and paper-based tickets, while providing commuters with convenient ways to pay. The use of electronic payment instruments such as smart cards and mobile-based ticketing are gaining momentum. With smart phone penetration on the rise, the implementation of ticketing like the QR code and Host Card Emulation (HCE) is on the rise globally. We have also witnessed the integration of digital payments with wearables and other payment forms in a few international markets.

In addition to reducing overheads associated with handling cash, electronic payments provide transit authorities with an opportunity to understand the purchasing habits and patterns of their commuters. This, in turn, helps them provide customised solutions, reduce costs and revenue leakages.

The diversity in ticketing systems and fare policies has to be simplified for public transport to become the preferred mode



Payment networks have played a vital role in standardising transit payments. Banks now offer transit cards to operators that are open loop and accepted at multiple touchpoints apart from transit. Firms have rolled out hybrid cards, dual application cards and single transit and payment applications cards enabled with Near Field Communication (NFC) technology. Transit is increasingly seen as an opportunity to attract new customers to the financial services ecosystem.

Transit system efficiency measuring parameters

1	Travel chip card readily available
2	Remote card loading
3	Ticket on mobile
4	Purchasing tickets directly through bank account/card
5	Purchase through contactless cards.
6	Multi-purpose use of card other than transit.

In the transit payments space in India, the adoption of open-loop cards has been slow. As highlighted in the recent Reserve Bank of India's (RBI's) benchmarking report[1], the release of the National Common Mobility Card (NCMC) specifications has been an important step towards the digitation of public mass transportation systems. However, significant steps still need to be taken to replace or upgrade existing transit solutions at a majority of public transport systems, along with a focus on enhancing the acceptance of NCMC cards by commuters.

Current opportunities

India has 62 state road transport undertaking units (SRTU), which have more than 1.6 million buses, and carry about 70 million people per day[2]. The suburban railways of Mumbai, Kolkata and Chennai contribute to more than 50% of all railway passengers with the daily ridership of 13.5 million. Ten live metro services witness a daily ridership of 4.6 million. Another 14 metro services are presently at various stages of implementation.

Given the size of the opportunity, the Government of India has taken several steps to ease and digitise transit payments for commuters. Closed-loop payment cards have been the preferred choice of transit payments for quite some time now.

The payment instruments in India have transitioned from closed-loop cards and combo cards to National Common Mobility Cards (NCMC), as illustrated in the diagram.

NCMC is a Government of India initiative with the vision of 'one card for all payments (transit as well as retail)'. This programme envisages the development of a cashless fare payment mechanism which will work across all the public transport systems in the country along with day-to-day retail payments. This would provide a seamless connectivity to commuters across all transit systems in the country. With 80% Indians having bank accounts[3],and 885 million debit cards[4] already issued, the focus on the replacement of existing cards with NCMC-enabled cards will help increase the penetration of digital payments in the transit space.

The onboarding of public transport operators (PTO) for NCMC projects involves activities such as the finalisation of the implementation model, selection of the Automated Fare Collection (AFC) provider and system integrator, and financial institutions. Implementation of NCMC projects involves a host of activities at each participating player's end as well the integration between these systems. Currently, there are 24+ debit cards, 9+ prepaid and 2 PPI issuers in India that are NCMC certified. Below is a set of typical activities undertaken by various participating entities in the NCMC project space.

Network schemes

- Responsible:
  - To route transactions
  - For overall governance
  - Recon & settlement for 'off us' transations
- Certify banks for NCMC deployment

Banks

- Smart card procurement & issuance
- Acceptance of cards outside transit
- Cash management activity
- Reconciliation and settlement
- Call centre/Helpline support
- Card-related certifications and EMV L3 certification

AFC service providers/ SI

- Fare rule management
- Daily/ weekly/ monthly passes
- Transactions' validation
- Call centre for gates and AFC-related issues
- Deployment of gates (TOM, TVM, etc.) at premises
- Ensure device certfications

Transport operators

- Premise availability
- Support infrastructure
- Operations and maintenance of existing infrastructure
- Manpower

Financial institutions have to undergo a set of onboarding pre-requisites to go live on smart cards (debit/credit/prepaid variants) as mentioned below.

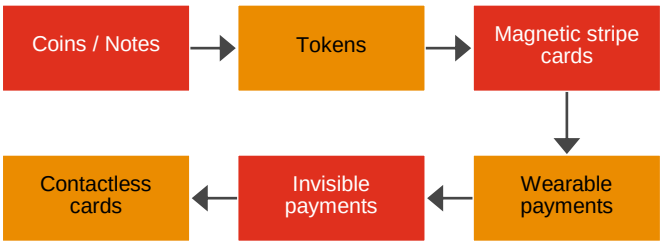
Issuer	• Card Applet/ other possible modes such as mobile wallet, QR code • White plastic certification • Issuer host/switch certification • Reconciliation & settlement certification
Acquirer	• Acquirer host/switch certification • Reconciliation & settlement certification • L1, L2 (maybe done by device providers) & L3 certification

In the recent past, the government and transit operators have undertaken various other initiatives to implement efficient and faster digital payment modes. Key steps taken include extending the outreach of debit cards through the Pradhan Mantri Jan Dhan Yojna initiative and payments banks.

The Reserve Bank of India (RBI) guidelines such as eliminating the need for a PIN for contactless transactions below Rs 2000 and authorising card payment networks to offer card tokenisation services to any requesters have greatly promoted the use of electronic payment instruments in the transit landscape. The Ministry of Urban Affairs has recently released a circular for an upcoming initiative wherein commuters will be able to travel in various metro rail services in India using a single smart card. Commuters can avail a limited number of trips on various metro networks using this card. This can be availed from transit operator outlets with minimum KYC requirements, and is distinct from the National Common Mobility card.

Global innovations in transit

Transit payments have witnessed innovation and transformation with the use of notes, coins and tokens to card payments, mobile payments and now to wearable payments like the smart watch, rings and other gadgets.



From cash to digital to omni-channel, various innovations in transit have lowered the cost of fare collection. According to a report on cashless cities[5], transit authorities spend 345% more on the physical collection of fares vis-à-vis digital fares., For toll payments, it has escalated to 190%.

With various factors in its favour such as being a fast-developing economy and having an enormous talent pool, India is in a favourable position for the development and testing of new transit payment technologies. Multiple emerging technologies are being slowly adopted across the globe, and are likely to be tested in India as well.

Use of new technologies in transit

1. Wearable technologies for payments

Earlier, wearables (like rings, wrist bands and watches) were used in closed-loop environments like festivals or theme parks. Today, wearables have emerged as a new-age form factor for payments and are used in open-loop environments such as transit payments. People can use these payment instruments at various transit touchpoints. Singapore has enabled the NFC fitness trackers to use their transit cards to pay for public transport. Brazil, Rio de Janeiro's public transportation ticketing operator, has also implemented contactless transport ticket wristbands for travel[6].

2. Sound-based technologies for payments

This technology allows commuters to make cordless and cashless payments with their mobile phones. It uses the speaker and microphone of the mobile and works on encoded ultrasonic audio frequencies (inaudible to the human ear). A leading bank in Abu Dhabi, along with a service provider, is offering an innovative proximity payment solution via sound waves to their clients across the UAE. An Israel-based company is developing sound-based technologies to work with their beacons to make payments possible through sound at various use cases.

3. Host Card Emulation (HCE)

HCE is a secure software architecture that can turn your mobile device into a payment card. Travelers can virtualize their transit cards to their smartphones for mobile and contactless transit payments. The HCE solution with offline support provides significant additional flexibility and reach in transit payments. Hong Kong has implemented Samsung Pay in metros, wherein commuters can pay by tapping their phones.

4. Payments using facial recognition

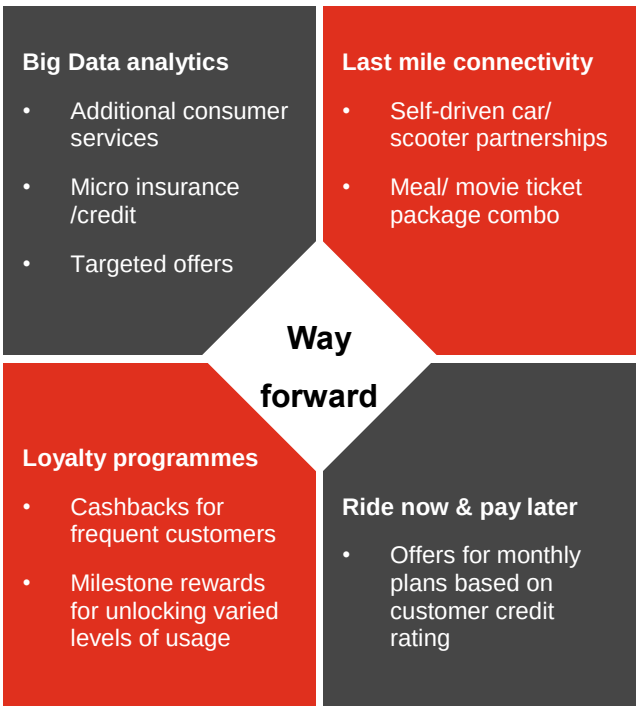
Facial recognition is considered to be the future of mass transportation. Shanghai's artificial intelligence double-decker tour bus and the Jinhua city bus have implemented a face-recognition technology for bus ticketing. A leading mobile wallet provider in China, along with a vendor, has rolled out “Smile to Pay” payment across 300 restaurants in China. The customer’s smile is registered as a unique identification or user ID. For further authentication, the customer has to enter a 4-or 6-digit PIN.

5. Biometric payments

Biometrics is used with several applications like an identity check, physical clearance and ticketing systems at airports, train stations and bus terminals. Biometric ticketing offers significant benefits and can drive the inclusion of digital payments in the public transport sector in the future. In a digital blueprint for Britain’s railways, a discussion on using biometric-based payments in trains to enhance customer experience has been mentioned.

The way forward

Transit payments are in an evolutionary phase in India and across the globe. Though the advancement in technology has made it easier to aid customers by reducing the commuters' effort, number of touchpoints and ease of transactions. However, transit authorities should also divert their attention to the long-overlooked needs of the commuters like last mile connectivity, customised offerings, loyalty, Ride Now Pay Later and other payment options.



creation of an accurate city-wide view of the transportation landscape using the multiple operator usage and utilisation in a city. The data analytics tool can create charts or graphs that can be used to identify challenges at a glance, based on fluctuations in the daily ridership and traffic pattern. Besides transit, big data analytics can also be used to provide additional customer services like food delivery by tracking the commuter, and also assist financial institutions to target the correct segment for cross-sales of credit/insurance.

Transit operators with access to the customer's travel data, which leads to potential partnerships/ cross-sales options with multiple restaurants/telecom/service providers to roll out offers to the end customer. Providing 'add on' services such as an additional talk-time or two hours of Netflix, or even 100MB of data for a particular duration of travel would add to customer satisfaction.

Food delivery/restaurants/fast-food joints with access to this data can use it for the timely delivery of orders as per the commuter's location and requirement.

Last mile connectivity

With public transport operators expanding their network across India, there is a need to broaden the scope of urban transportation beyond traditional models. For a seamless integration with city transit, innovative models of shared and connected transport systems should be leveraged.

Many companies are trying to solve the last-mile connectivity equation by combining various public sector and non-public sector transport options, also known as multi-modal transport. The way forward for such technologies will be to design effective commute planning considering traffic density and other factors like parking rules, road type, day and time. A sample use case is illustrated below:

1. A person wants to travel from his home to the office

2. Commuter opens an app and enters the start location and end destination.

3. The app analyses and calculates the fastest-possible route by combining options like cab pick-up from the start location to the nearest local train station.

4. It then suggests a route from local train station A to local station B with metro connectivity.

5. Now a cab can be automatically booked to pick up the customer at metro station B for the final destination- his office.

The commuter will have to pay a consolidated amount just once before starting the journey. There should be a provision at the back-end to pre-book and settle the fare with the respective authorities and merchants.

A solution to the last mile connectivity issue will encourage customers to use public transport in place of private vehicles. Integration with the feeder bus service and electric rickshaws are already in-line with last-mile connectivity, but partnerships with services such as a self-driven car or self-driven electric scooters as operational in San Francisco and New York, can help commuters further. The 4G/ GPS systems can be used to track the car/scooter, and the combo ticketing can aid customers.

Loyalty programmes

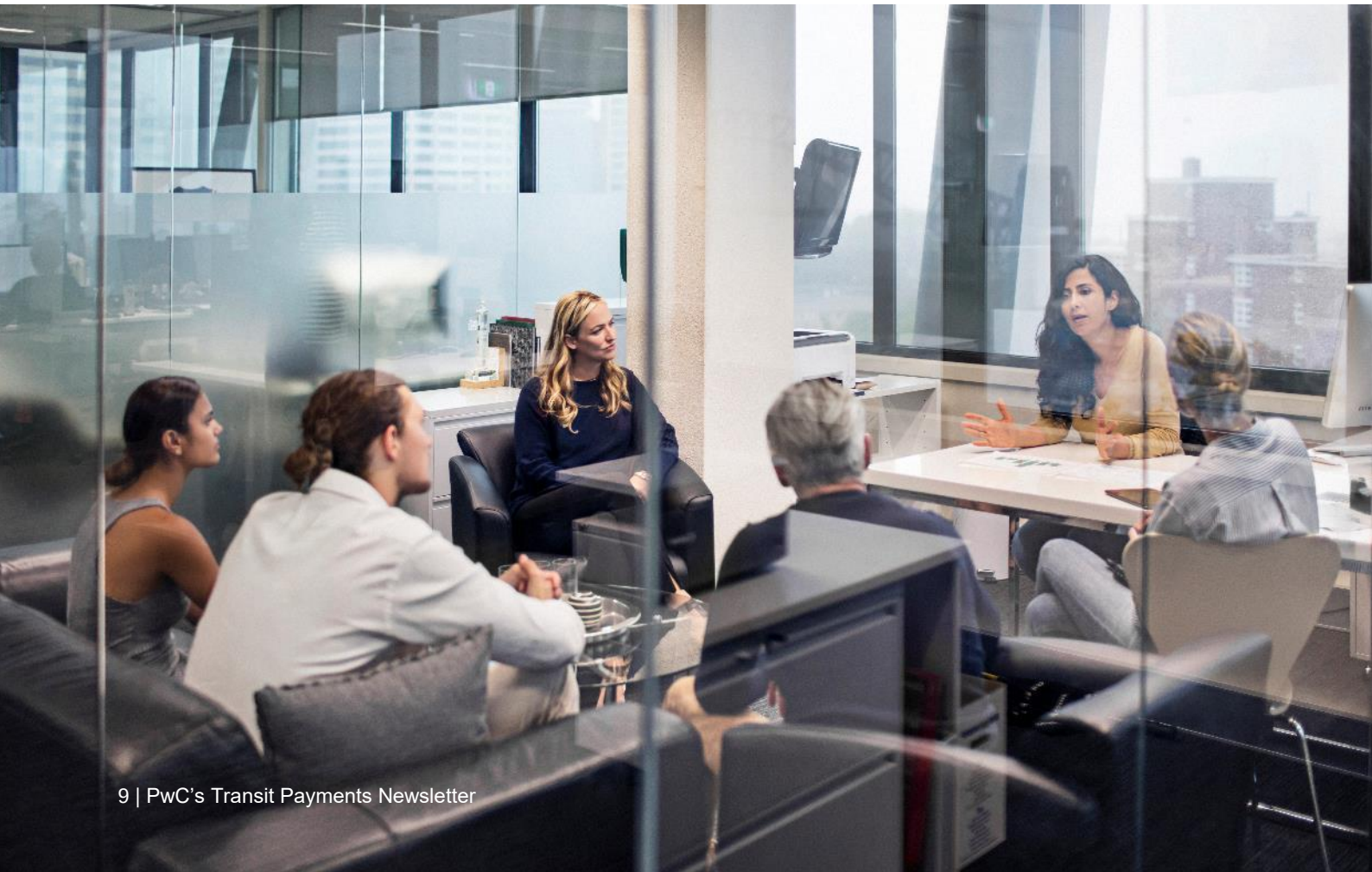
Having a centralised loyalty programme across public transport modes brings an advantage of efficient travel management for both operators and commuters. Cashback, rewards, meal coupons, free movie tickets and other customised offers basis the ticketing, location and pattern of usage can help to push usage of public transport and attract more commuters to the public transport modes.

Ride Now & Pay Later

The implementation of a service like ‘Ride Now & Pay Later’ will help daily/regular commuters across the transport network to be billed only once for multiple journeys, thus easing their travel.

Commuters’ credit rating can be analysed, and based on the same, they may be offered credit for travel expenses for 15 days/ 30 days, or for a specific number of journeys. A nominal fee can be charged per customer type/journey availed by the customer. Options such as monthly/ quarterly subscriptions, with the auto renewal facility applicable for travel across multiple modes can also be explored.

The transit space is yet evolving, and there is huge scope for innovations and initiatives in the transit ecosystem for FinTech players, financial institutions, transport operators and the government. The boost in the adoption of digital payments across the transit ecosystem can have a huge impact on all the stakeholders in the ecosystem.



Sources

1. Benchmarking India's payment systems. RBI (2019). Retrieved from https://www.rbi.org.in/Scripts/PublicationReportDetails.aspx?UrlPage=&ID=923. Last accessed on 26th June 2019

2. Association of State Road Transport Undertakings. Retrieved from http://www.asrtu.org/. Last accessed on 26th June 2019

3. Economic Times. Retrieved from https://economictimes.indiatimes.com/industry/banking/finance/banking/number-of-adult-indians-with-bank-accounts-rises-to-80/articleshow/63838930.cms?from=mdr

4. RBI BANKWISE ATM/POS/CARD STATISTICS retrieved from https://rbi.org.in/scripts/ATMView.aspx?atmid=98

5. Cashless cities- Realising the benefits of digital payments. Visa. Retrieved from https://usa.visa.com/dam/VCOM/global/visa-everywhere/documents/visa-cashless-cities-report.pdf, Last accessed on 26th June 2019

6. Rio de Janeiro launches Gemalto contactless transport ticketing wristband. Retrieved from https://www.gemalto.com/press/pages/rio-de-janeiro-launches-gemalto-contactless-transport-ticketing-wristband.aspx

Payment technology updates

Soon, a single card to let you ride any metro in the country

Times of India

The government will soon unveil a new smart card that can be used across all metro rail networks for a limited number of trips. Passengers would need to charge them at the counter when they go to avail the services in different metro networks.

Read more…

India roll-out of the national transit card system

NFC World

India is launching a single card which can be used to pay for travel on all transportation systems across the country. The National Common Mobility Card (NCMC) can be used on metros, buses and suburban railways, as well as to pay for parking and tolls and in shops.

Read more…

a ticket to ride through Smart Software Cities

Forbes

Anyone who regularly traverses through a large metropolitan area like London, New York, Chicago or perhaps Frankfurt, Paris or Barcelona will no doubt have come in contact with the city's mass transport system. These systems all run on some form of rolling stock and, today, they all run on some type of software backbone.

Read more…

Contact us

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