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भारतीय राष्ट्रीय भुगतान निगम
NATIONAL PAYMENTS CORPORATION OF INDIA

RuPay

NCMC

Leading the way in Smart Mobility Payments.

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Executive Summary

The launch of RuPay NCMC is closely aligned with India's broader objectives, including the Digital India initiative, the promotion of a cashless economy, and the development of smart cities. Prior to the introduction of RuPay NCMC, the transit system relied on closed-loop cards that were restricted to the respective operators.

RuPay NCMC is designed as an interoperable multi-purpose card, which facilitates seamless integration across various transportation modes and operators. As per RBI guidelines for offline transactions, RuPay NCMC has a maximum stored value limit of INR 2,000 and a transaction cap of INR 500. Additionally, RuPay NCMC is enabled on all RuPay contactless debit, credit, and prepaid cards, simplifying its acceptance and usability.

This report outlines the development of RuPay NCMC from its inception, emphasizing the continuous efforts by all the stakeholders to drive its widespread adoption. It chronicles the various stages of the card's evolution, including strategic initiatives from Ministry of Housing and Urban Affairs (MoHUA) and advancements made by National Payments Corporation of India (NPCI).

To illustrate the impact of RuPay NCMC, the report presents case studies from Mumbai, highlighting how the card has significantly improved travel experiences in the city. The case study demonstrates the card's effectiveness in enhancing user convenience by connecting multiple modes of transportation. An insight into global examples of similar common mobility cards from around the world offers additional perspectives on the benefits and implementation of such systems.

The report also highlights the measures implemented by the government and organizations in supporting the adoption of RuPay NCMC.

The report further delves into the extended applications of RuPay NCMC, highlighting its utility beyond traditional transit to other areas such as metro parking payments, access management in events and solutions for last-mile transit. These additional use cases showcase the card's versatility and its potential to significantly enhance user experiences across diverse sectors.

This report is an endeavor to emphasize the pivotal role of RuPay NCMC in advancing the case for smart, seamless and cashless mobility payments in India.

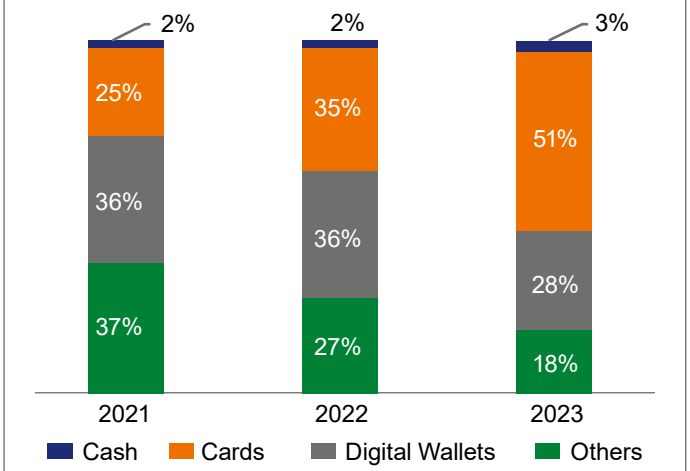
1. Introduction

1.1 Background

Digital India has brought two significant transformations, the broad adoption of digital payments and the advancement of smart cities. In recent years, India has experienced a pronounced shift towards cashless transactions, a transformation leading to increased financial inclusion and widespread adoption of digital payment methods. This shift is supported by a series of government-led initiatives and the expansion of payment infrastructure.

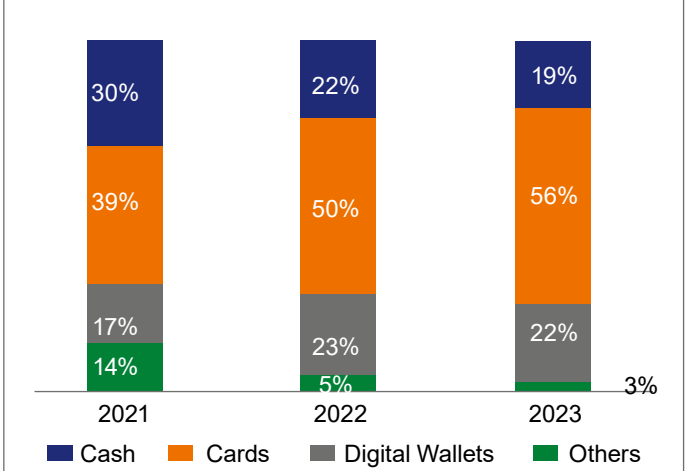
Data from the Ministry of Finance underscores the remarkable growth in digital payment transactions. The volume of digital transactions surged from INR 2,071 crore in FY 2017-18[1] to INR 18,807 crore in FY 2023-24[2], reflecting a compound annual growth rate (CAGR) of 44 percent . This growth highlights the growing reliance on digital financial transactions.

Payment Methods during Store Purchases (Based on transaction value)



*Digital wallets include UPI payments
*Other includes POS based financing and prepaid cards

Payment Methods during E-Com Purchases (Based on transaction value)



*Digital wallets include UPI payments
* Other includes BNPL, prepaid cards, account-to-account transactions

Source: WorldPay Global Payments Report

[1]https://pib.gov.in/PressReleasePage.aspx?PRID=1988370

[2]https://digipay.gov.in/dashboard/default.aspx

Digital payments are growing traction across all sizes of value transactions. That said, UPI and prepaid cards have become a prevalent choice for facilitating smaller payments. This trend indicates a significant shift towards the widespread acceptance and utilization of cashless payments for routine and low-ticket transactions. The growing preference for digital payments is also boosting growth in modern commerce.

At the same time, Digital India is resulting in promoting innovation and digital empowerment in Smart Cities Mission. Digital solutions aim at providing enhanced quality of life through integration of technology, infrastructure, and governance. Some of the common applications have been e-governance, green buildings, waste management, energy management etc.

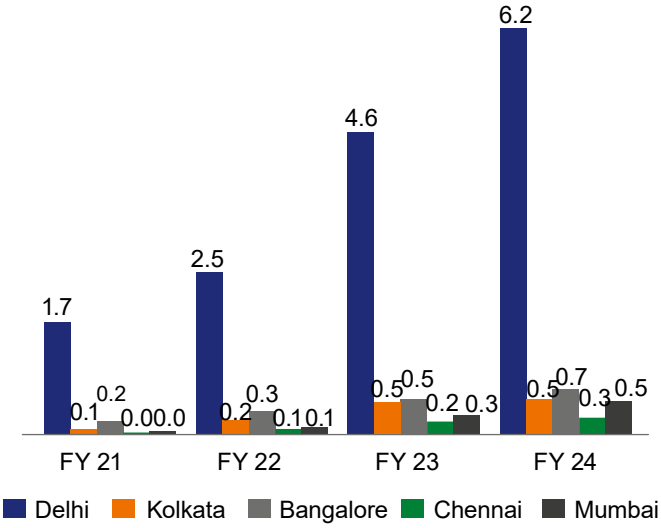
At the intersection of these advancements lie the concept of smart mobility solution. The integration of payment systems with urban digitization is revolutionizing transportation, providing a seamless, unified platform for urban mobility nationwide. Some key aspects of smart mobility in India include real-time traffic management, GPS-enabled buses, electronic ticketing systems, integrated transport solutions, electric vehicles, unified mobility platforms, and automated parking systems.

Several Indian cities have made significant strides towards implementing smart mobility solutions. For instance, Delhi Metro Rail Corporation (DMRC) has introduced closed-loop cards and QR-code based ticketing for cashless travel in Delhi Metro, while Chennai has a closed-loop card and mobile ticketing app for its Metro. Mumbai has a mobile app providing real-time bus tracking and route information. Pune has introduced a bicycle-sharing system.

Average ticket size of transactions in INR (FY 24)	
Credit Card	5,143
Debit Card	2,592
UPI P2M	652
Wallets	371
Prepaid Cards	312

Source: NPCI, RBI

Average Daily Metro Ridership (in Million)



* Mumbai metro ridership for FY 21 includes the data starting from Sep'20.
FY 21- FY 23 includes the ridership for Line 1 whereas FY 24 includes Line 1, 2A, 7 and Navi Mumbai.

Source:
DMRC Annual Report, Kolkata Metro, Chennai Metro Rail Annual Report, Bangalore Metro Rail Corporation Ltd. Annual Report, NPCI

In the evolving urban development landscape, integrating smart city initiatives with transportation systems and cashless transit payments presents significant opportunities to improve efficiency and decision-making. Cashless transit payments align with the objectives of smart cities by streamlining fare collection processes, reducing the reliance on physical cash, and generating data on travel patterns and passenger behavior.
This data, if analyzed using technology can provide invaluable information for city planners and transport authorities, enabling them to make well-informed decisions, enhance service delivery, and improve overall urban mobility.

The rising need for mobility cards arose with a growing number of individuals choosing public transit options such as metros, driven by urbanization, a move towards more sustainable lifestyles and the demand for efficient and seamless payment systems. The increase in the customer base for intracity public transportation is evident from the significant ridership statistics of Mumbai Metro Line 1, which serves 960 million commuters and had a ridership of 11.1 million as of May 2024[3], along with other intracity transport networks, as illustrated in the chart above. Intercity ridership has also grown, with more people choosing railways and airlines. From FY 21 to FY 24, annual railway ridership surged at a CAGR of 73.5 percent, while domestic yearly airline ridership increased at approximately 43 percent CAGR over the same period[4]. Growth across different modes of transport highlights the need to integrate advanced smart solutions into transit systems.

This, in turn required a robust ticketing system to accommodate the growing use of public transit by taking advantage of the major shift towards cashless payment. Among various ticketing options for Metro, commuters prefer closed loop cards. In Delhi, 74 percent of the metro commuters use closed loop cards; the percentage stands at 64 percent and 61 percent in Chennai and Bengaluru, respectively .

Although ticketing systems, such as QR code-based systems and closed-loop cards have advanced, India's current public transportation ticketing infrastructure still faces several challenges:

- **Closed Loop/Semi-Closed Loop Cards**: Transit cards are restricted to specific merchants or operators, necessitating multiple cards for different use cases, restricting the interoperability, and affecting user experience and convenience.

- **Limited Popularity:** Closed-loop cards are specific to individual operators and lack interoperability. Their limited usability across different modes of transportation has hindered widespread adoption, resulting in lower levels of digital penetration.

- **Increased Costs:** Operators and merchants incur expenses such as post-expiry card issuance etc. for managing the lifecycle of these cards. On the other hand, customers are required to provide a security deposit at the time of purchasing the closed-loop card. This deposit is refundable upon the issuance of a new card or the return of the existing closed-loop card.

- **Network Connectivity:** Transactions using digital payment methods like UPI requires network connectivity and in case of network issue there may be a delay in transaction processing.

In alignment with Prime Minister Shri Narendra Modi's vision of 'One Nation, One Card' and 'Digital India,' RuPay National Common Mobility Card (NCMC) was introduced by the Ministry of Housing and Urban Affairs (MoHUA) on March 4, 2019. The MoHUA and National Payments Corporation of India have collaborated to develop RuPay NCMC.

1.2 RuPay NCMC

RuPay NCMC was introduced as a solution to the issues associated with current public transportation ticketing infrastructure by providing a unified, open-loop and interoperable payment solution that enables users to pay for a wide range of services with a single card. This initiative represents a significant step towards integrating public transport ticketing across cities and different modes of transportation, creating a cohesive and efficient system. Since its launch, RuPay NCMC has been successfully rolled out in multiple transit systems across the country. The card is now widely accepted in transit systems that comply with RuPay NCMC standards, reflecting its successful integration into the public transport ecosystem.

[3] https://www.reliancemumbaimetro.com/performance
[4] https://economicoutlook.cmie.com/

Existing RuPay contactless debit, credit and prepaid cards are equipped with NCMC functionalities which offers additional capability of offline transit payments along with traditional card features. This adaptation enhances the versatility and utility of these cards, aligning with the objectives of RuPay NCMC initiative.

48
Card Issuers

164 Mn+
Cards issued

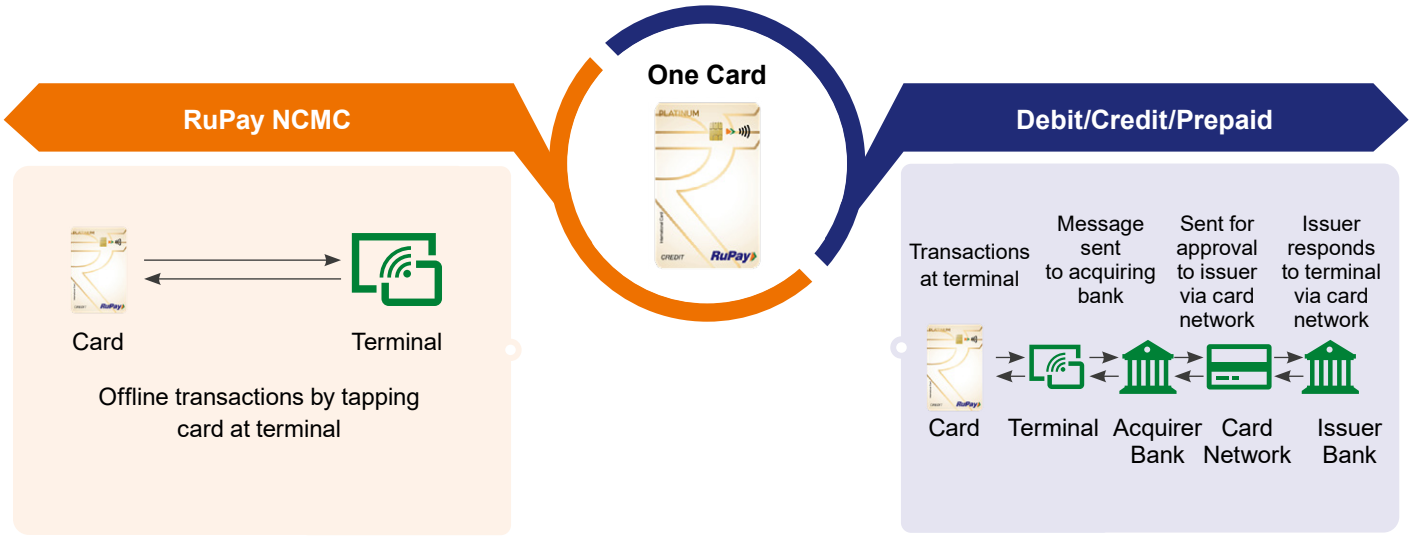
13
Operators

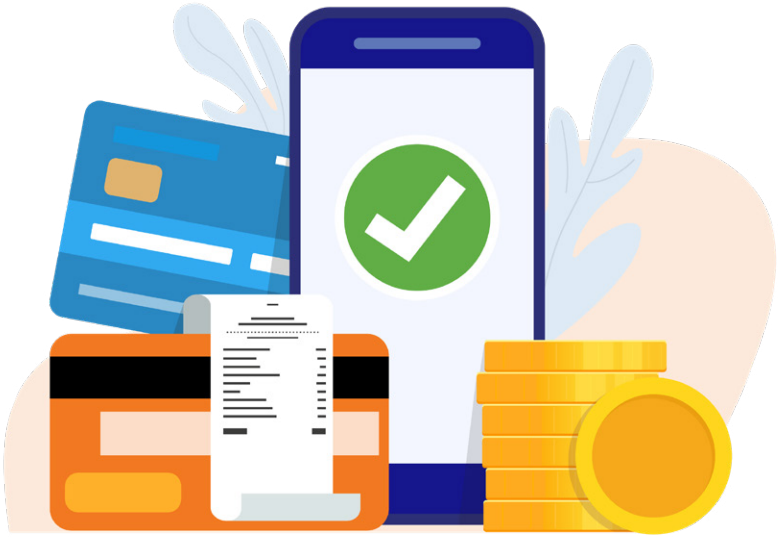
0.71 Million+
Online Txn.2021

Source: NPCI

• **Transit and mobility transactions (Offline)** for various public transportation systems like buses, metro etc., support contactless offline transactions.

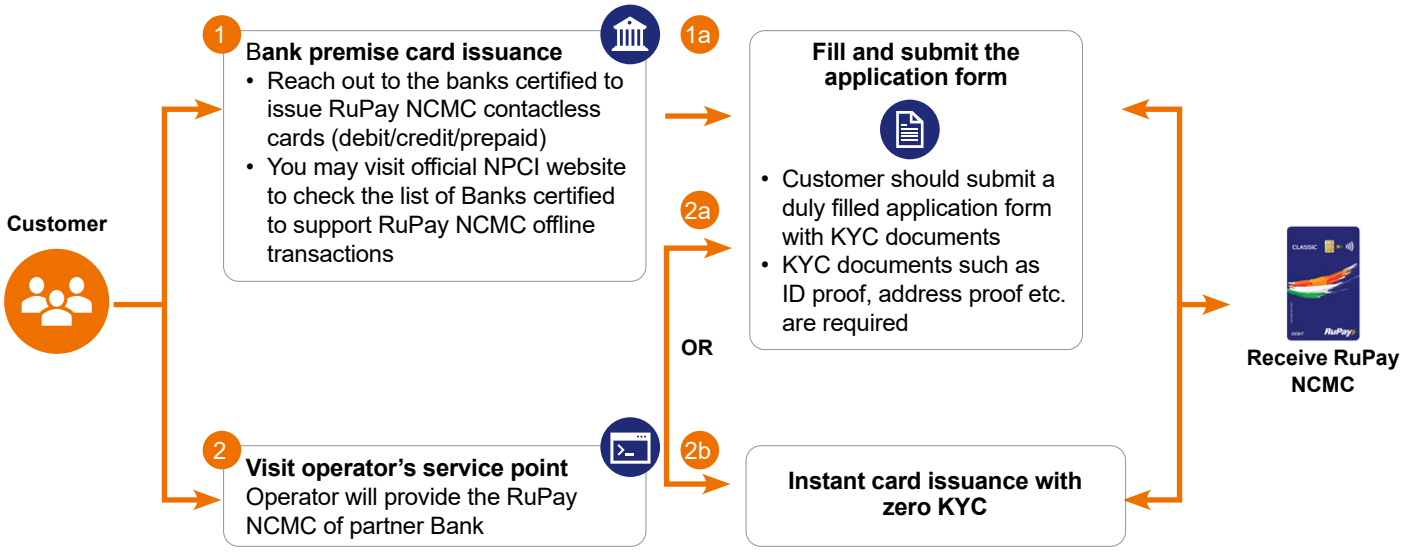
• **Banking transactions (Online)** such as ATM withdrawals, online shopping, in-store purchases, etc., support both contact and contactless transactions.





This section will provide a detailed overview of how RuPay NCMC operates, outlining its core functionalities and convenience for customers.

How to apply for RuPay NCMC



Note: Users already having a contactless RuPay debit/credit/prepaid card (with symbol), can directly activate the card if your bank supports NCMC offline transactions

1.3 Core features of RuPay NCMC

RuPay NCMC is designed to streamline and simplify transit payments while ensuring security and convenience. It aims to promote a cashless, unified payment system that enhances user experience. Below are some of the core features of RuPay NCMC, which make it a versatile and efficient solution for seamless transactions across various transportation modes and beyond

Offline Capability
RuPay NCMC supports offline transactions, decreases reliance on network access

Open Loop & Interoperability
RuPay NCMC can be used across various transportation modes nationwide

Storage of Information
Service areas can store operator specific information such as monthly passes

Existing Infrastructure
RuPay contactless debit, credit and prepaid cards can be used as RuPay NCMC

Multi-Purpose
RuPay NCMC can also be used for everyday retail purchases, parking payments, access management etc.

Contactless Transactions
Use of NFC technology to facilitates quick, tap-and-go payments

Security
Upper limit of INR 2,000 on stored value and INR 500 on each transaction. Also embedded with EMV technology

Different Forms
Available in different form factors like wearables etc.

1.4 Benefits of RuPay NCMC

For Customers

- Seamless Travel
- Quick and Efficient
- Convenience
- Customer-centric
- Rewards

For Operators

- Reduced Operating Costs
- Ease of Implementation
- Minimum Risk
- Accelerated Deployment
- Elimination of Vendor Lock-In

For Issuers

- Access to Unbanked Customers
- Increased Usage
- Data Insights

1.4.1 Benefits for Customers

• **Seamless Travel:** RuPay NCMC enables usage of a single card across various modes of transport including metro, bus etc. The same card also works across different cities making it ideal for frequent travelers and tourists.

• **Quick and Efficient:** Existing RuPay contactless debit/credit/prepaid cards can work as RuPay NCMC. One card can be used for multiple purposes such as retail purchases, access management etc.

• **Convenience:** The card eliminates the need for queuing to purchase tickets or tokens and supports cashless payments, reducing the need to carry cash.

• **Customer-centric:** RuPay NCMC's open-loop standards enable customers to select the card issuer of their choice.

• **Rewards:** RuPay NCMC offers discounted rates and rewards to customers.

> The introduction of the RuPay National Common Mobility Card (NCMC) has been a pivotal step in enhancing the ease and convenience of public transportation across Delhi and the National Capital Region. The interoperability across various transit systems, has significantly improved the customer journey by providing a seamless travel experience. Moreover, with the upcoming integration of RuPay NCMC with the DTC bus network, commuters in Delhi will benefit from a truly unified and efficient transportation system. The ability to use a single card across multiple modes of transport will make commuting smoother, more convenient and less time-consuming for our passengers.
>
> **~ Dr. Amit Kumar Jain, Director Operations & Services, DMRC**

1.4.2 Benefits for Operators

• **Reduced Operating Costs:** Public Transport Operators (PTOs) can significantly lower costs associated with card lifecycle management and cash handling.

• **Ease of implementation:** The use of standardized payment acceptance devices and the availability of multiple vendors facilitate a smoother implementation process. With partner banks managing the payment-related tasks, PTOs can concentrate on their core operations and optimize service delivery.

• **Minimum risk:** Stored value systems reduce financial risks for operators by eliminating the aggregation of payments over time.

• **Accelerated Deployment:** The adoption of uniform implementation processes, best practices, and reference guidelines ensures standardized procurement and request for proposals (RFPs) for onboarding AFC service providers. This approach significantly speeds up the deployment of digital payment solutions within public transport systems.

• **Elimination of Vendor Lock-In:** Open-standard-based payment acceptance devices offer flexibility in purchasing and renewing digital ticketing solutions. This freedom prevents operators from being restricted to a single vendor, allowing them to choose the best solutions and negotiate favorable terms.

1.4.3 Benefits for Issuers

• **Access to new and unbanked Customers:** RuPay NCMC allows issuers to reach a wider customer base by providing a transit payment solution.

• **Increased Usage:** The card being a unified transit solution can enhance card usage.

• **Data Insights:** Issuers can offer personalized services to customers, basis their spending behavior.

The subsequent section of this report will explore further innovations and developments related to RuPay NCMC. This will ainclude advancements in technology, enhancements in functionality, and prospects for expanding the card's usage within the public transportation network and beyond. These developments are anticipated to build upon the foundational benefits of RuPay NCMC, driving continued progress in digital payment integration and reinforcing the card's role in modernizing transit systems across the country.

2. Journey of RuPay NCMC

2.1 Journey of RuPay NCMC

Over the past six years, NPCI has concentrated on expanding the implementation and adoption of RuPay NCMC to underscore the government's vision of "ONE NATION, ONE CARD". RuPay NCMC has witnessed phased implementation in Metros and State bus transport services. In the upcoming years, the implementation of RuPay NCMC to all other public transport services such as trains, auto rickshaws, ferries, and taxis/cabs is planned. The journey has been smooth with valuable learnings along the way.

2019

- **Official launch** of RuPay **NCMC** (National Common Mobility Card) ecosystem by Prime Minister Narendra Modi
- **Pilot Implementation** of RuPay NCMC in **Delhi & Mumbai,** focused on metro and bus systems

2020

- **Expansion of RuPay NCMC pilot** in Bengaluru
- RuPay NCMC functionality made **operational** for the **airport line of DMRC,** as a part of the phased expansion of RuPay NCMC

2021

- **RuPay NCMC introduced in Goa transport (KTCL)**
- **~50 Mn RuPay NCMC** enabled debit cards issued by 25 banks collectively
- **~22 banks** certified for RuPay NCMC

2022

- **BEST** is one of the **first public transport** service in the country to get **RuPay NCMC enabled**

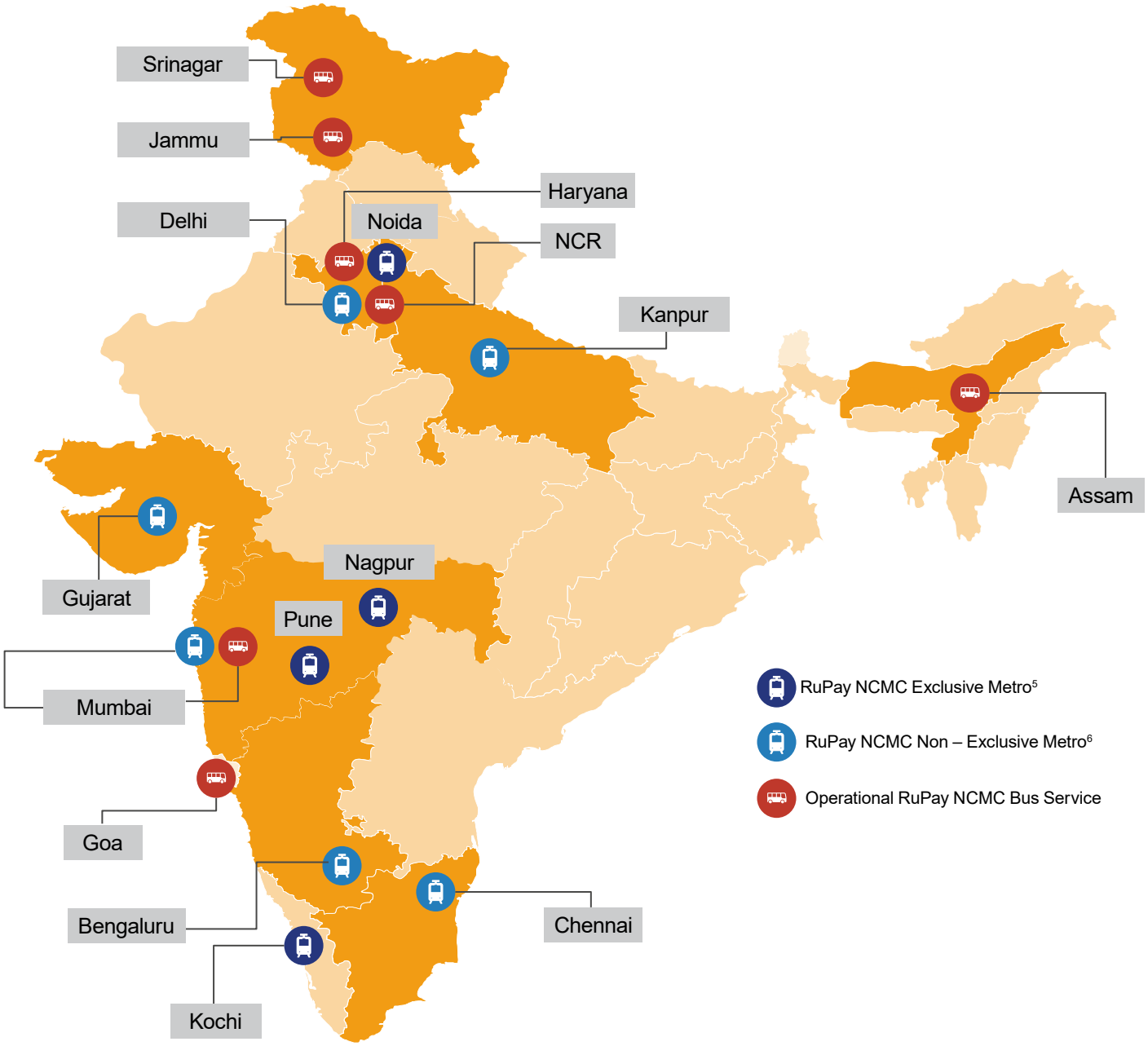
2023

- **RuPay NCMC projects live in –** Delhi Metro, Gujrat Metro, Chennai Metro, Bangalore Metro, Kanpur Metro, Mumbai Metro Line 2A & 7, NRCTC
- All new cards from participating issuers to be RuPay **NCMC enabled**
- **MUMBAI METRO Line 1** fully upgraded (100%) all fare gates to accept RuPay NCMC

2024

- **RuPay NCMC projects live in –** Jammu City Buses, Haryana Roadways, Srinagar Smart City Buses, Assam Bus
- Introduction of **RuPay NCMC for G-Eazy event and RuPay-powered wristbands** for the **2024 TATA IPL event** access management
- Introduction of **RuPay NCMC** recharge as a **new biller category** in **BBPS** for specific issuers
- Implementation of **RuPay NCMC for parking in CMRL**
- Introduction of **Prepaid Payment Instruments for Mass Transit**
- **~200 Mn RuPay** NCMC–enabled cards are in circulation

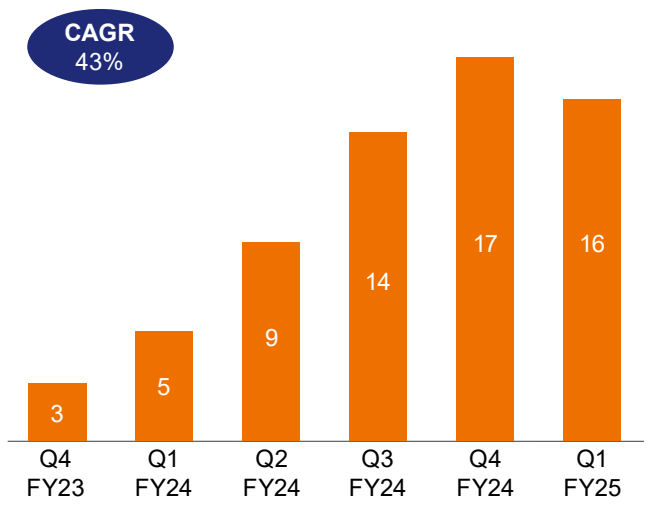
RuPay NCMC Coverage Map



[5]Exclusive NCMC metro means a single bank is selected as an acquirer
[6]Non-Exclusive metro means any RuPay NCMC is accepted by the transit operator

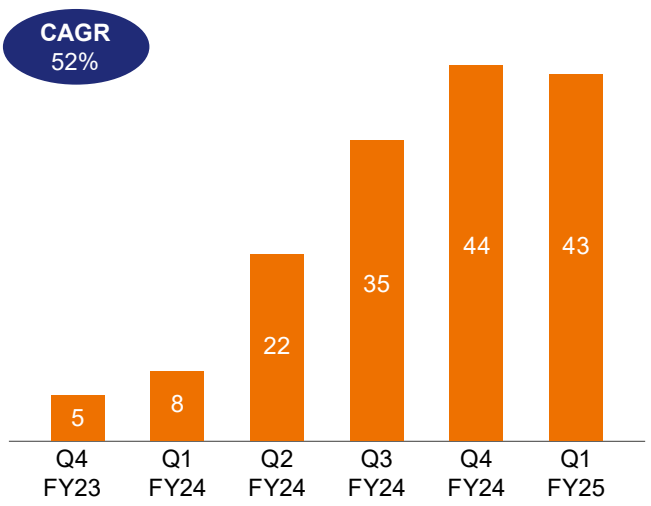
2.2 RuPay NCMC Performance

RuPay NCMC Transaction Volume (In Million)



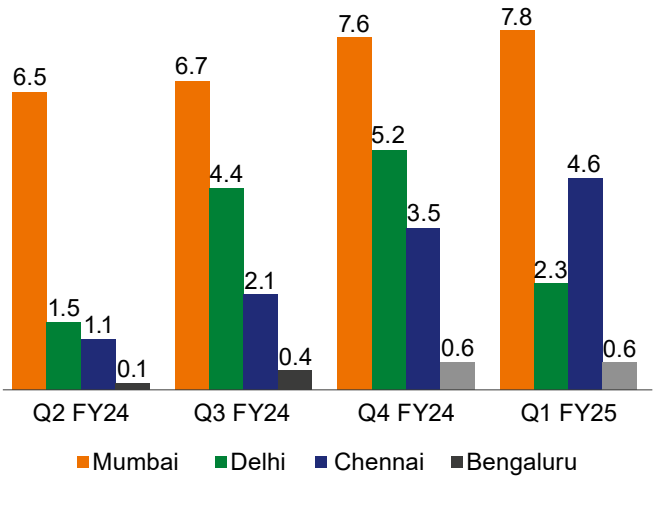
Source: NPCI

RuPay NCMC Transaction Value (In INR Cr)



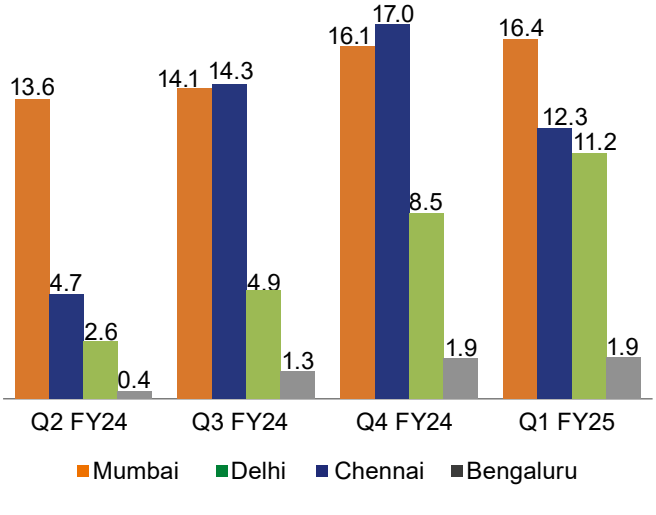
Source: NPCI

RuPay NCMC Transaction volume City wise (in Million)



Source: NPCI

RuPay NCMC Transaction value City wise (in Cr)



Source: NPCI

RuPay NCMC has witnessed a growth in both transaction value and volume, reflecting its increasing adoption and broader use across cities and transit modes. Since Q4 FY 24, the volume of RuPay NCMC transactions for buses has surged by 72%, while metro transactions have risen by 29%. Additionally, the value of bus transactions using RuPay NCMC has doubled, and metro transaction values have grown by 39% over the same period. The above graphs illustrate this growth trend in four metro cities: Mumbai, Delhi, Chennai, and Bangalore.

2.3 Key challenges in implementation and adoption

The introduction of RuPay NCMC was a first step towards streamlined and unified access to public transportation systems in India. With continued efforts towards enhancing the customer value proposition, there has been a gradual, progressive increase in the use of RuPay NCMC. However, it has yet to realize widespread adoption and impact. As with other large-scale initiatives, the journey towards the 'ONE NATION, ONE CARD' has also encountered challenges in implementation and adoption. Some of these challenges include:

Shift from existing closed loop cards to RuPay NCMC

Many users in cities like Delhi, Chennai, Bengaluru are accustomed to using transport operator provided closed-loop cards, leading to reluctance in adopting RuPay NCMC. This hesitation comes from the familiarity with existing closed-loop cards. However, in Mumbai, RuPay NCMC was implemented as the default payment method for transit in the newly built metro lines 2A and 7. Due to which we have seen significantly higher adoption and penetration rates.

Know your customer (KYC) for RuPay NCMC

Existing closed-loop cards issued by various transport operators do not require KYC documents and are issued across the counter within two minutes. In contrast, RuPay NCMC requires users to complete basic KYC requirements as mandated, which is cumbersome from the user's perspective.

RuPay NCMC Activation and Top up

Previously, users had to visit transport operators' kiosks to activate their RuPay NCMC in order to create a common service area for transit usage. Similarly, to top up RuPay NCMC customers had to visit the metro station or bus stations. This was especially inconvenient during peak hours, resulting in long queues and delays.

NPCI has undertaken additional measures to enhance user awareness and experience, as well as to simplify the user journey for RuPay NCMC. These initiatives are outlined below:

Pre-Created Common Service Area

To enhance interoperability and maximize customer convenience, RuPay NCMC now features a pre-created common service area functionality in the card from day one. Previously, the users had to get common service area manually created for transport services once the card was issued by the bank. However, for the creation of operator service area (monthly passes and passes with discounted

Addition of funds through UPI

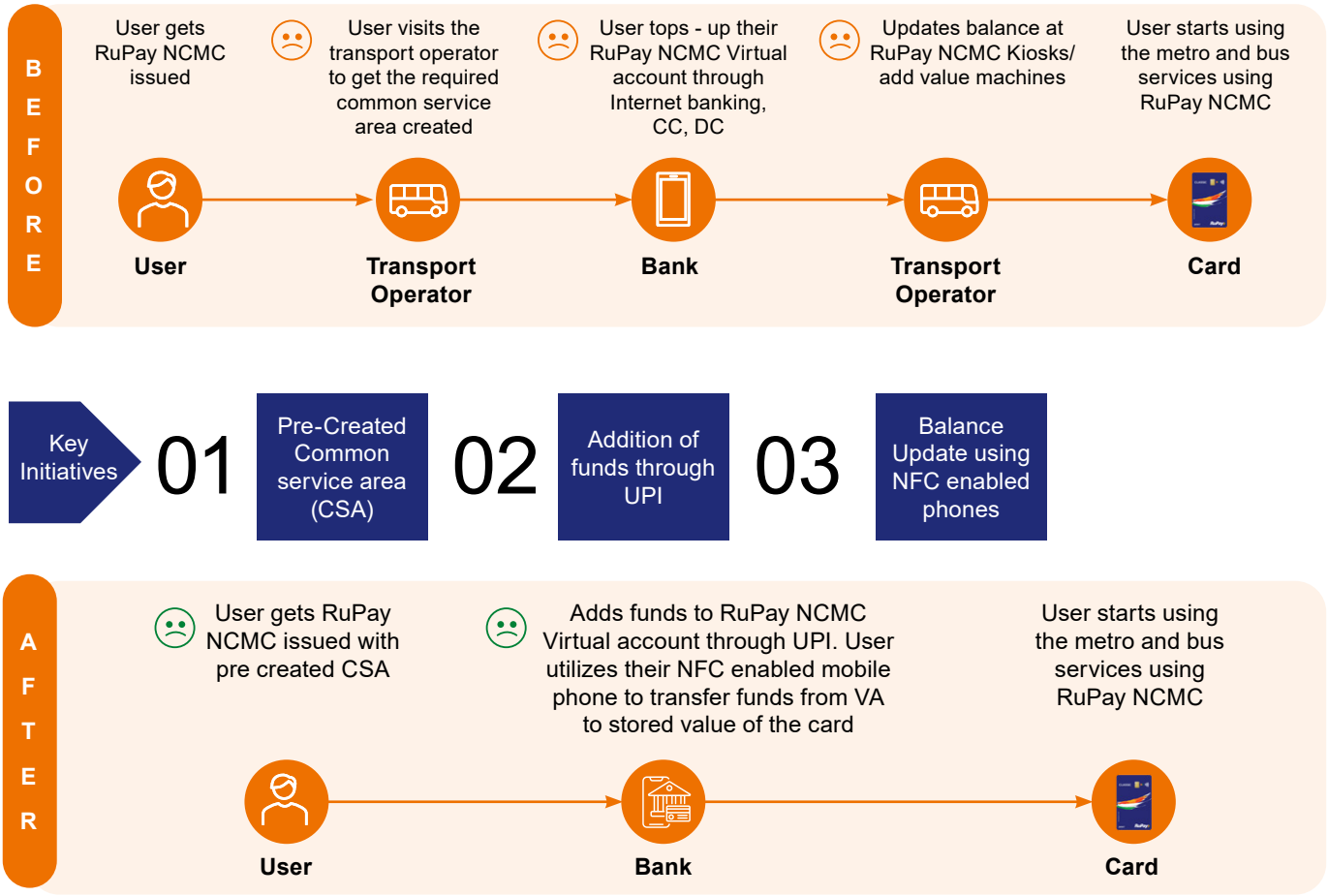
To genuinely enhance user convenience, a new feature has been introduced, allowing users to top up their RuPay NCMC virtual accounts via UPI with a few clicks, enabling the user to choose to pay from their choice of issuer application or third-party app. This development ensures a seamless and uninterrupted experience by eliminating the need for issuer-specific payment methods, such as internet banking and mobile banking for fund addition.

Updating the card balance using NFC enabled mobile phones

Earlier, in case of online top up through the digital banking/ internet banking channels, the virtual account which is linked to the card is topped up first and the customer needs to perform a balance update transaction in order to write the balance on the stored value of the card. Customers usually perform the balance update transaction at metro station's add value machines or the bus conductor's terminal. With the new development, users can now update the stored value of the card just by tapping the card on the NFC enabled mobile phone making it ready to use for transit.

With the above product developments, NPCI has worked towards enhancing the user journey, making it frictionless and convenient for commuters. Below is a comparison of the user journey before and after the introduction of some key initiatives:

Customer Journey: before and after Key Developments[7]



Since its launch, RuPay NCMC has undergone several innovations to enhance user experience. These advancements have not only improved the card's functionality but have also expanded its potential applications. In the subsequent section, we will explore these evolving use cases in detail.

> RuPay National Common Mobility Card (NCMC) in our bus transit system has significantly enhanced the customer journey not only in buses but also in Mumbai metro. With RuPay NCMC, our passengers can effortlessly transition between different public transportation systems using single card, simplifying their daily commute. Moreover, the digitization of card recharge process has been a remarkable innovation. Customers can now easily update their card balance with just a tap of the card on an NFC enabled mobile phone, the updated balance is instantly reflected. This feature has not only improved convenience but also streamlined the entire process, making it quicker and more user-friendly.
>
> **~ Shri Anil Diggikar, IAS, General Manager, BEST**

[7]The journey is Illustrative.

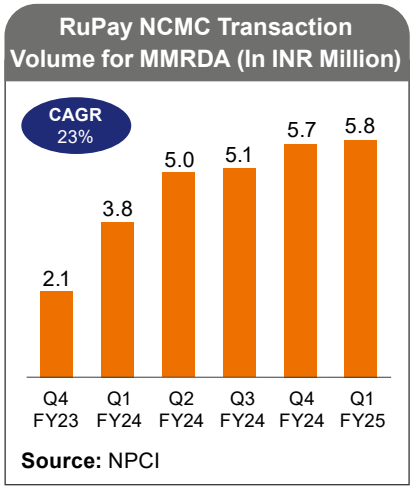
3. Case Studies

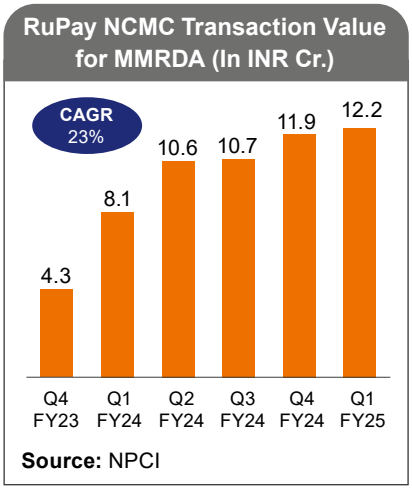
3.1 Seamless Travel in Mumbai: NCMCs Now for Buses and Metro

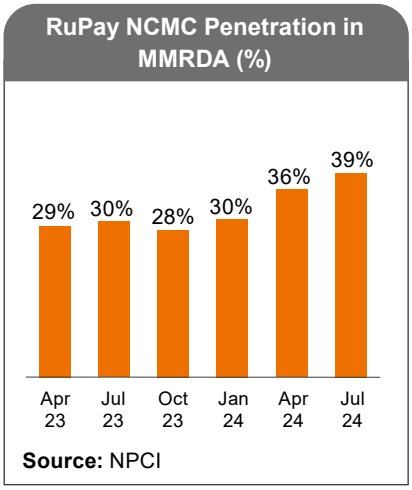
The Mumbai metro and BEST buses (Brihanmumbai Electric Supply and Transport) together form an integrated public transport network that enhances mobility, reduces traffic, and supports the city's growing transportation needs. The Mumbai metro currently has three operational lines—Line 1, 2A, and 7—with several more under construction. Metro lines 2A and 7 have reached a combined ridership of 100 million, while Metro Line 1 has recorded 900 million cumulative riders since its launch in June 2014[8]. Similarly, BEST bus service has a fleet of 3,153 buses catering to daily ridership ~3.2 Mn k commuters[9].

Commuters have been lately adopting digital methods to reduce ticketing inconvenience. However, the multiplicity of different ticketing and payment systems across different modes of transport has created a complex ticketing environment.

National Payments Corporation of India (NPCI) introduced RuPay NCMC for BEST buses in April 2022, which marked a significant milestone as BEST became one of the first public bus transportation services to adopt this system. Expanding on this success, NPCI further integrated RuPay NCMC with the metro in January 2023, making it an interoperable travel card across Mumbai BEST and Mumbai metro services.







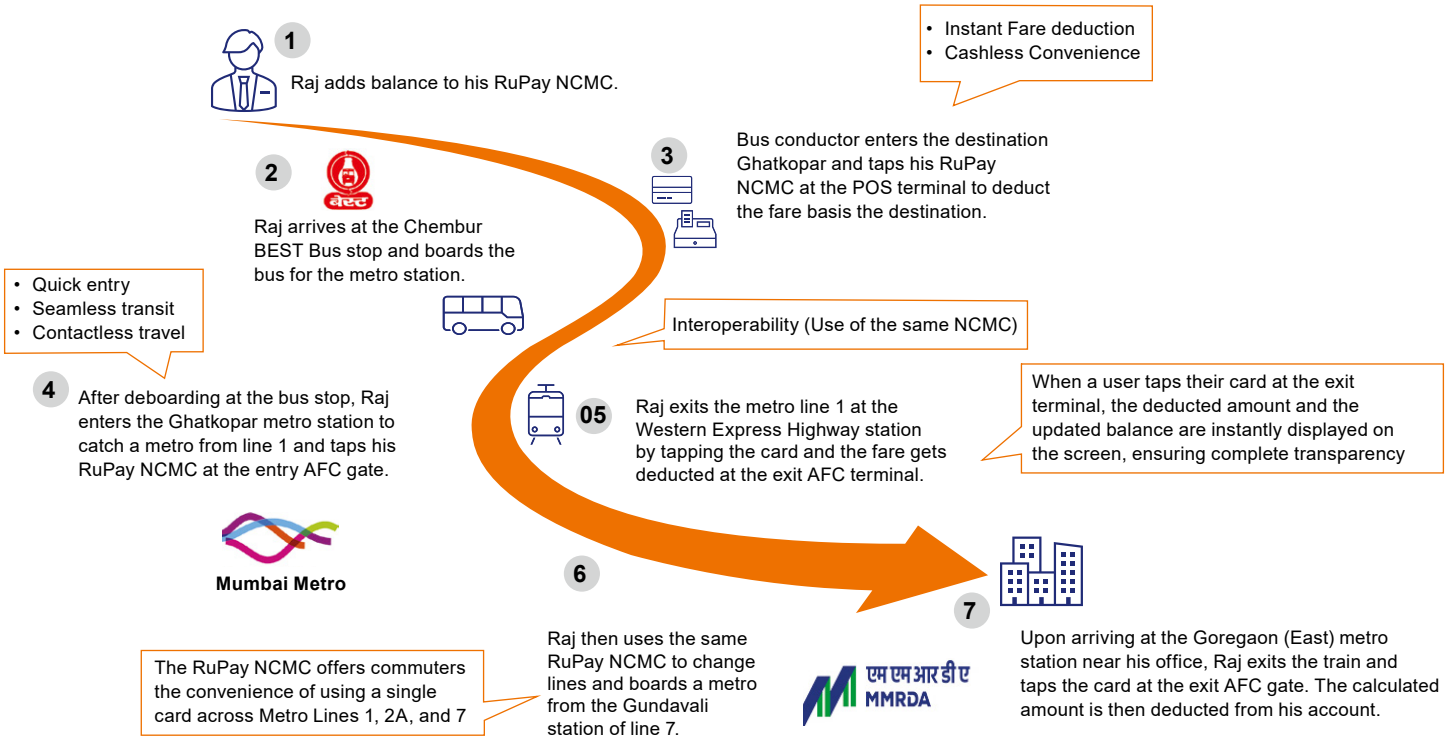
As illustrated above, both transaction volume and value have shown consistent growth over the period which indicates increasing adoption and popularity among transit users of RuPay NCMC.

[8]https://timesofindia.indiatimes.com/city/mumbai/metro-1-ridership-touches-90cr-in-9-yrs-of-operation/articleshow/105740127.cms

[9]https://www.hindustantimes.com/cities/mumbai-news/heavy-rains-stall-the-pace-of-best-bachao-movement-101721846289505.html

A day in life of a Mumbai commuter using RuPay NCMC

A commuter can now effortlessly transition from a BEST bus to the Mumbai metro using a single card, eliminating the hassle of carrying multiple tickets or passes. Below is an illustration of Raj's journey who avails public transport on daily basis to reach his office.



To boost the adoption of RuPay NCMC for daily commuting, NPCI has partnered with top banks to provide enticing discounts. For example, users of metro line 1 can enjoy travel discounts based on their travel times: a 10% discount on weekends and holidays, and a 5% discount on weekdays[10] . Even all the discounts and concessions provided by the transit operators are also applicable on RuPay NCMC.

Multiple metro projects currently underway in Mumbai. For example, the upcoming metro line 3 is projected to serve 1.7 million passengers daily, accommodating around 2,500 passengers per train[11]. Similarly, BEST plans to procure 10,662 buses by 2025[12] and it has also introduced new buses along the routes of metro lines, which are designed to provide seamless travel for people changing from buses to metro or vice versa, hence promoting interoperable travel.

As the metro and bus network grows, it will lead to more commuters adopting the card, contributing to the overall growth of the card's usage in the city

[10]https://www.mmmocl.co.in/pdf/news-articles/29JAN-HT.pdf

[11]https://economictimes.indiatimes.com/industry/transportation/railways/mumbai-metro-aqua-line-3-bkc-to-aarey-phase-1-operations-set-to-start-from-july-check-route-map-and-stations/articleshow/110485988.cms?from=mdr

[12]https://www.hindustantimes.com/cities/mumbai-news/best-lays-out-detailed-plan-to-procure-10-662-buses-by-2025-101702235141055.html

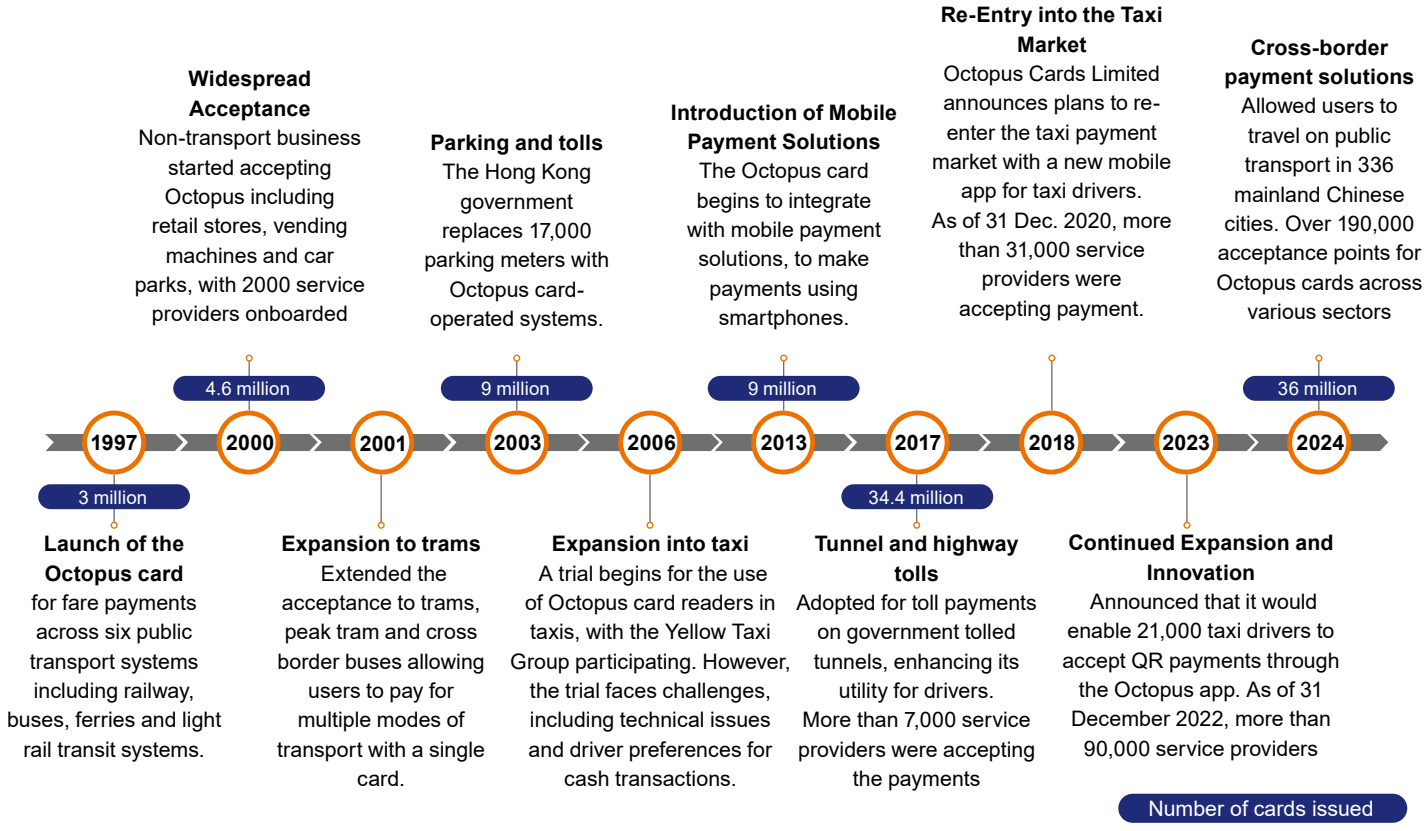
3.2 Global Case Studies – Hong Kong and Singapore

Over the years, we have seen successful evolution of transit cards globally, gradually progressing from one transit mode to many, and further extending use at retail stores, vending machines, restaurants, etc. These global examples demonstrate how the continuous enrichment of use cases and product features has been key to driving adoption and usage, and in simplifying user journeys.

3.2.1 The Octopus Card: Transforming Hong Kong's Payment Landscape

Introduced in 1997, the Octopus card has become widely accepted in Hong Kong, evolving from a fare card to a versatile payment tool across various sectors, including public transport, retail, and services. It allows seamless travel on the MTR (Mass Transit Railway), buses, ferries, and trams with a simple tap. To recharge the Octopus card, users can conveniently use cash at designated machines in MTR stations or various retail outlets. For added convenience, top-ups can also be made through credit or debit cards by using the Octopus app. Nearly 98 percent of Hong Kong citizens aged 16 to 65 possess an Octopus card with more than 15 million daily transactions valued at HK$342.6 million.[13,14]

Evolution of the Octopus Card



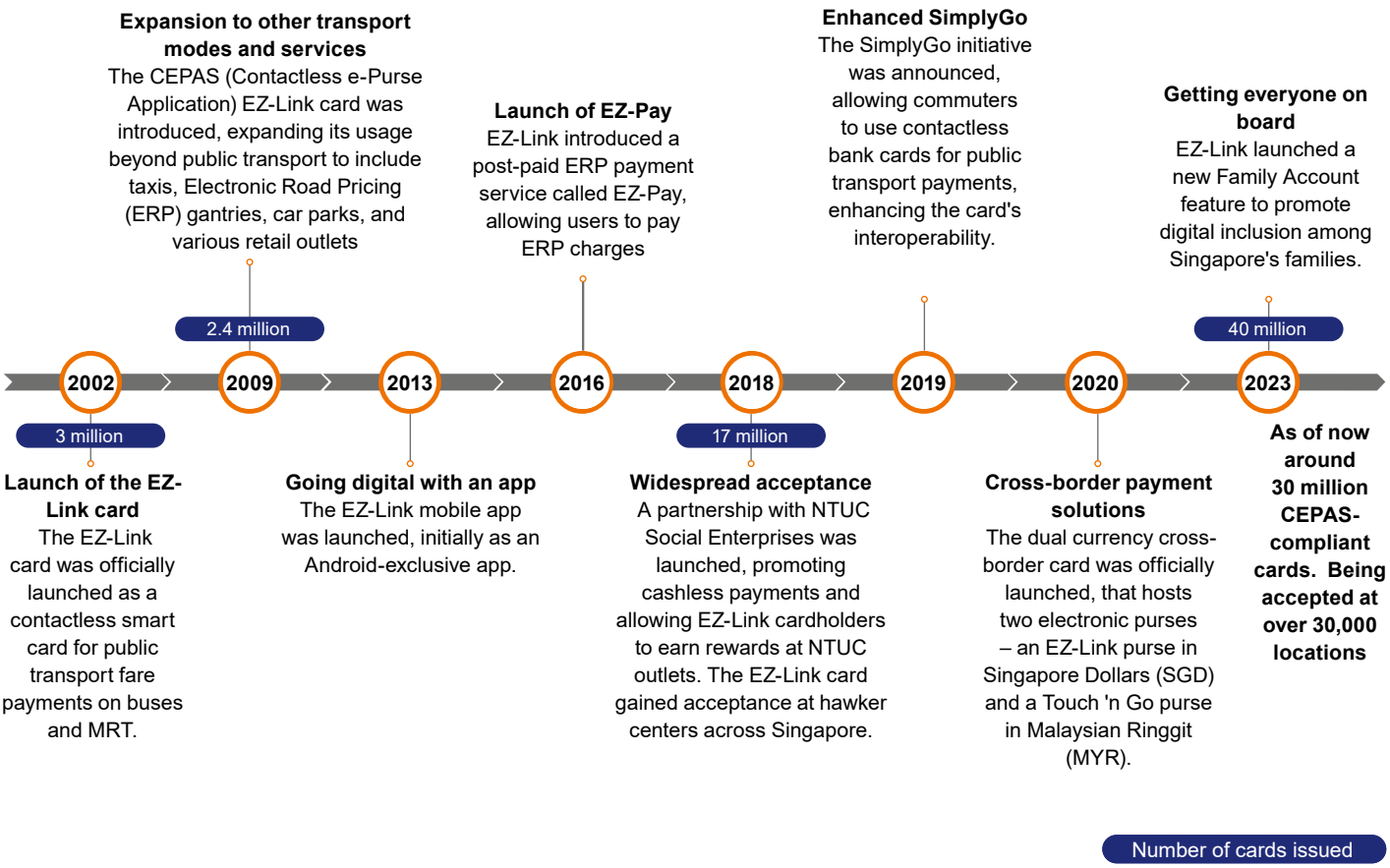
[13]https://timesofindia.indiatimes.com/city/mumbai/metro-1-ridership-touches-90cr-in-9-yrs-of-operation/articleshow/105740127.cms

[14]https://www.hindustantimes.com/cities/mumbai-news/heavy-rains-stall-the-pace-of-best-bachao-movement-101721846289505.html

3.2.2 EZ-Link card in Singapore

Launched in 2002, EZ-Link transformed Singapore's transport payments, evolving from a fare card to a versatile payment tool. The card became CEPAS (Contactless ePurse Applications, a Singapore standard)-compliant in 2009, allowing it to be used across various services beyond public transport, including taxis, ERP (Electronic Road Pricing), and retail outlets. It offers added value through mobile apps, rewards programs, and expanded acceptance points[15]. As of now, around 30 million CEPAS-compliant cards are being accepted at over 30,000 locations.

Evolution of the EZ-Link Card



[15]https://www.ezlink.com.sg/2018/02/01/ez-link-ntuc-link-and-cheers-join-hands-to-encourage-cashless-transactions/

4. Initiatives Complementing RuPay NCMC

The government is prioritizing the development of transportation infrastructure as part of its broader initiatives to modernize transit systems and advance smart city projects. As per MoRTH, the National Highways network increased by 60 percent from 2014 to 2023. India is also moving closer to becoming the second-largest metro network in the world. This strategic focus on expanding infrastructure enhances ridership and stimulates greater use of cashless payments across transportation modes. RuPay NCMC is amongst the key advancements NPCI has been pioneering in the digital payments space.

4.1 Expansion of Maetro Rails Across Cities

Over the past two decades, India has made substantial progress in expanding its metro networks, driven by rapid urbanization, increased economic activity and budgetary allocations, and a growing emphasis on reduced environmental impact. As of 2023, ~874 km of metro rail is operational in 20 cities nationwide. The growth of metro rail in India is evident from the surge in ridership figures, with daily passenger numbers surpassing 10 million and projected to exceed 12.5 million within the next one or two years[16].

This increasing demand has prompted the launch of new metro lines and the expansion of metro services to additional cities, such as the recent inauguration of the Agra Metro on March 6, 2024. To enhance metro accessibility in cities with lower ridership, the Government of India is exploring innovative projects such as the Kochi Water Metro and the Metro Neo Project, aimed at further extending metro services nationwide.

The expansion of Metro significantly increases the user base and the demand for efficient and seamless payment solutions. As passenger numbers escalate, the necessity for streamlined ticketing systems becomes more pronounced.

~10 Mn+
Daily Ridership (Jan'24)

25+ New Cities
Targeted for Metro Expansion

16+
Metro Projects under Construction

INR 21,247 Cr.
Allocated for Metro in Budget 2024-25

Source: Ministry of Housing & Urban Affairs, Indian Metro

4.2 Bus Transit

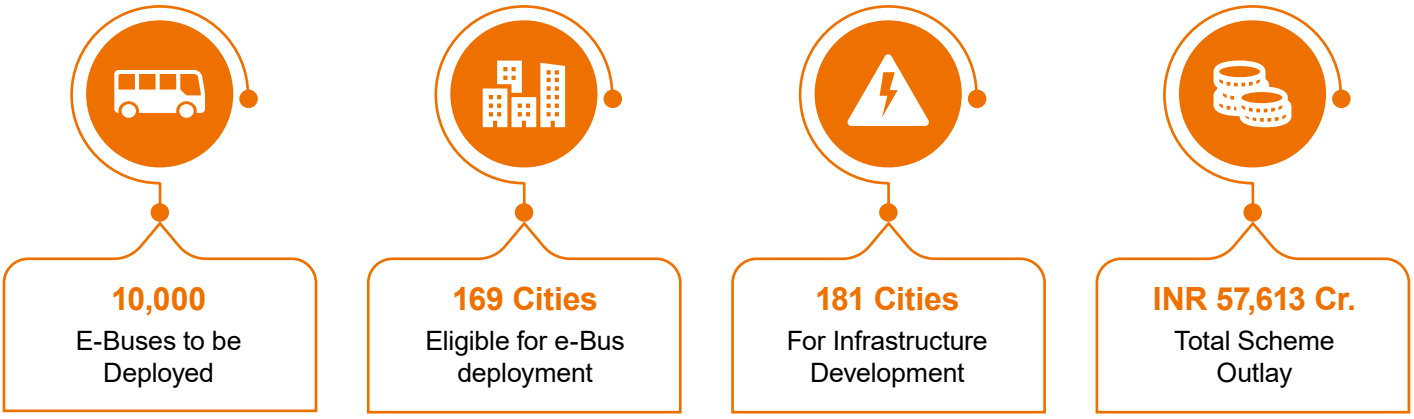
India has made substantial advancements in rural road infrastructure, with approximately 3.74 lakh kms of roads constructed since 2014 under the Pradhan Mantri Gram Sadak Yojana (PMGSY)[17]. This development has led to over 99 percent of rural habitations being connected, reflecting the government's dedication to improving accessibility and connectivity in rural regions.

Buses represent a major mode of public transportation, offering extensive connectivity. According to data from the Ministry of Road Transport and Highways (MoRTH), India currently operates 1.8 million buses, accommodating over 300 million passenger trips daily[18] . The MoRTH Annual Report 2022-23 indicates that there are 62 State Transport Undertakings (STUs) managing a total of 1.46 lakh operational buses[19].

PM e-Bus Seva

On August 16, 2023, the Ministry of Housing and Urban Affairs (MoHUA) introduced the "PM e-Bus Sewa Scheme" to enhance e-mobility and incorporate electric buses into urban public transportation systems. The Indian government allocated INR 57,613 crore[20] to increase the fleet of electric buses through a Public-Private Partnership (PPP) model. Additionally, the scheme aims to develop bus infrastructure including charging infrastructure and RuPay NCMC-based Automated Fare Collection Systems in 181 cities.

The e-Bus Sewa initiative facilitates the shift to cashless fare payments, aligning with the objectives of RuPay NCMCs.



4.3 RBI directions on Prepaid Payment Instruments (PPIs) for Mass Transit Systems

The Indian government has undertaken several policy initiatives to promote the adoption of RuPay NCMC.

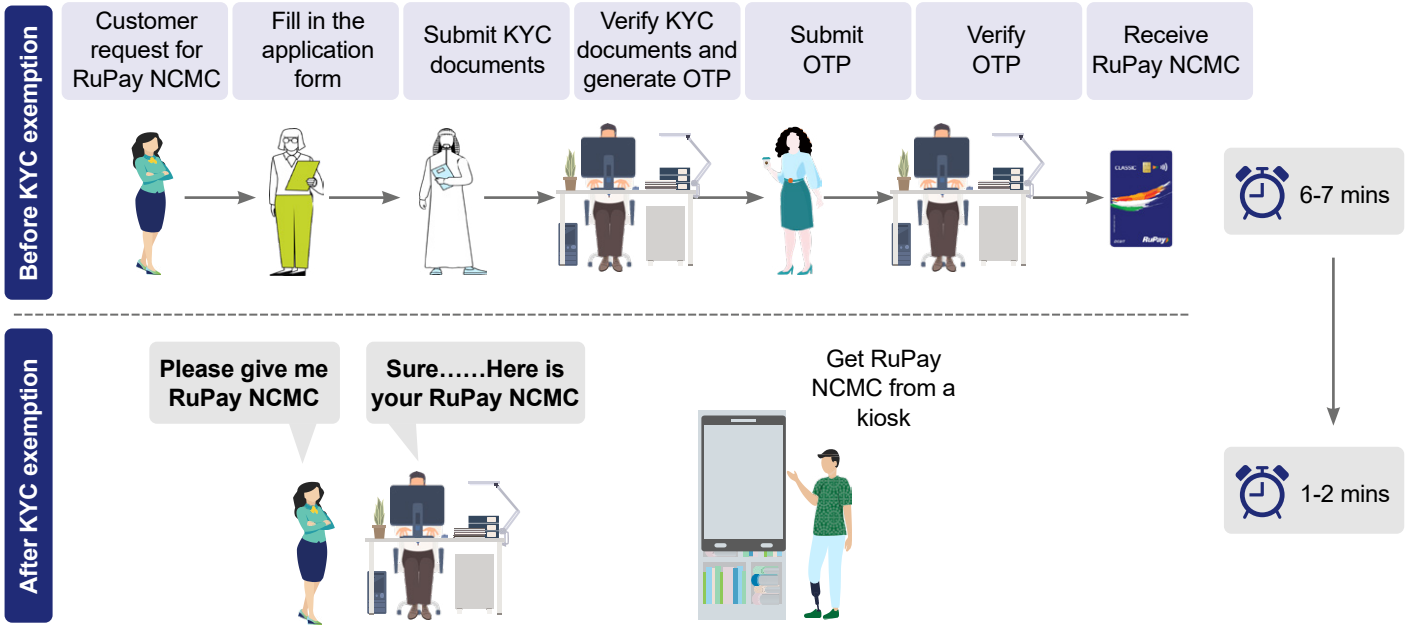
According to the RBI Master Directions of 2016[21], mass transit operators were allowed to issue semi-closed PPIs. Initially, these PPIs could only be used at merchants whose activities were related to or conducted within the premises of the transit system, with a card limit not exceeding INR 2,000. On August 27, 2021, updated directions raised this limit to INR 3,000[22] .

Further changes came with the updated directives issued by the Reserve Bank of India (RBI) on February 23, 2024[23], which permitted both banks and non-banking entities to

[18]https://itdp.in/tag/public-transport/#44716a43-d12b-463e-9aa1-f1f447906210-link
[19]MoRTH Annual Report, 2022-23
[20]https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1949430
[21]https://www.rbi.org.in/commonperson/english/Scripts/Notification.aspx?Id=1889
[22]https://www.rbi.org.in/Scripts/BS_ViewMasDirections.aspx?id=11142
[23]https://rbi.org.in/Scripts/BS_ViewMasDirections.aspx?id=12156

issue Prepaid Payment Instruments (PPIs) with Automated Fare Collection applications for public transit payments in India without requiring KYC verification, provided the card limit does not exceed INR 3,000. These PPIs will not permit cash withdrawals, refunds, or fund transfers.

The exemption from KYC requirements streamlines the card issuance process, enabling users to receive RuPay NCMCs more swiftly, reducing the time from 6-7 minutes to just 1-2 minutes. This increased convenience is expected to attract more users, particularly those requiring immediate access to a transit payment solution.



> The introduction of PPI-MTS category, CMRL is the first metro to deploy self-dispensing kiosks across 13 stations in our network. These kiosks have revolutionized the card issuance process, allowing customers to get their cards with just the click of a button. This innovation has drastically reduced the time required for the card issuance, ensuring a faster and more efficient process for our commuters. By streamlining the issuance process, we have not only improved the customer journey but also set a new standard in public transportation services. We are proud to lead this initiative and are committed to continuing our efforts to provide world-class services to our passengers.
>
> **~ Mr. M.A. Siddique, IAS, Managing Director, CMRL**

4.4 Innovations by FinTech

The rise of FinTech companies has significantly advanced cashless transactions through innovative technologies that improve convenience, security, and user experience, closely supporting the broader adoption of RuPay NCMC.

Fintech companies are focusing on enhancing the overall efficiency, and user experience of public transportation systems by providing access to accurate travel information, streamlined navigation and timely updates. This is achieved by enabling live tracking of buses, metro, local trains, and monorail, route planning and providing real-time updates. Fintech companies are also working towards creating a unified ecosystem where multiple mobility service providers can operate on a shared standard network.

5. Extended Use Cases of RuPay NCMC

RuPay NCMC, extends its services beyond traditional transportation applications by offering versatile solutions for various use cases. The extended use cases, as demonstrated by the global examples in the previous chapter, are gaining traction along with increased adoption of the primary transit use case. The growing adoption of these extended applications highlights RuPay NCMC's potential to streamline transactions and improve user experiences across multiple sectors.

5.1 Parking Payments

RuPay NCMC is further extending its use to parking payments, simplifying the urban transit experience. This interoperable card will allow commuters to use a single card for both transit and parking.

This use case has already been introduced in Chennai, where Chennai Metro Rail Limited, in partnership with a leading bank, has launched RuPay NCMC for metro parking facilities. The same card is also being used for metro transit, providing commuters with a truly integrated payment solution.

5.2 Access Management

RuPay NCMC can now be effectively used for non-financial use cases like access to events, colleges and premises etc. leveraging its contactless and service area capabilities.

IPL - RuPay – On-The-Go

In a first-of-its-kind initiative, NPCI in collaboration with TATA IPL, introduced the "RuPay – On-The-Go" wearable. This wearable was given to VIP and VVIP ticket holders at the TATA IPL 2024 playoffs and final matches, allowing them easy access to their respective lounges.

Moreover, the same wearable can be used to make purchases at retail outlets and for transit payments making it an interoperable payment solution.

Contactless transactions up to INR 500

Tap & pay across stores without a pin

Offline Transactions Up to INR 500

With no internet connectivity

5.3 Integrated Transit Enabling Last Mile Connectivity

RuPay NCMC plans to offer a solution for enhancing the boarding experience across diverse transportation modes, reducing wait time, and eliminating the need for physical tickets and cash handling, enhancing the overall efficiency of transportation systems.

To enhance last-mile connectivity, RuPay NCMC may also be used to unlock and pay for e-cycle services. Users may use these cards for paying fares in auto-rickshaw, boats, taxi, and other modes of transportation.

RuPay NCMC card has established itself as a transformative tool in India's payment and transportation landscape. This report has highlighted the card's evolution, supported by global and Indian case studies that demonstrate its effectiveness. The exploration of extended use cases and government initiatives further illustrates the card's potential to drive significant advancements in urban mobility and financial inclusion. The continued development of RuPay NCMC and its integration with evolving technologies and infrastructure will be crucial. By leveraging these advancements, RuPay NCMC is well-positioned to enhance user experiences, promote seamless transactions, and support the broader goals of digital innovation and smart city growth in India.