



# Contactless Payments Penetration Assessment

Moving Toward a Contactless Payments Ecosystem in the United States

November 2023

# TABLE OF CONTENTS

- TABLE OF FIGURES..... 3
- EXECUTIVE SUMMARY..... 4
- INTRODUCTION..... 7
- THE CONTEXT OF CONTACTLESS PAYMENTS..... 8
  - From magnetic stripe to the contactless payment standard..... 8
  - The uptake of contactless payment technology..... 9
  - Adoption of contactless payments during COVID-19..... 9
- THE UPTAKE OF CONTACTLESS PAYMENTS IN THE U.S..... 9
  - Research Methodology ..... 9
  - Public data review findings..... 10
  - In-depth interviews with industry player findings..... 13
- CONCLUSIONS AND RECOMMENDATIONS ..... 14
- Appendix A - Sources..... 17
- Appendix B - CARB Contactless Payments Market Penetration Survey ..... 19
  - CARB Contactless Payments Market Penetration Survey ..... 19

## TABLE OF FIGURES

Figure 1. Industry players confirmed transition to contactless technology.....	11
Figure 2. Percentage of contactless cards in force .....	11

## EXECUTIVE SUMMARY

This review provides insight on the level of penetration of contactless payments in the financial ecosystem to support CARB's efforts to monitor new technologies, with focus on improving the public electric vehicle charging stations payment experience.

### **The context of contactless EMV**

Contactless EMV (cEMV) payment technology, which stands for Europay, Mastercard and Visa, has had a significant impact on the way people pay for goods and services around the world. Contactless payment technology is an evolution in the payments industry, which in past decades has adopted magnetic stripe and chip technologies to provide a reliable, secure, and fast payment experience for users. Today, contactless payments are quickly becoming the standard for issuing banks and financial organizations in the United States, following similar trends observed around the world.

### **Research Methodology**

The methodology chosen for this analysis draws on the following two sources of information:

- **Public data** - Web-based sources that provide insights on the uptake of contactless payments in the United States. Our sample included annual reports, industry publications, press releases, marketing pieces, and other relevant materials that recounted the different contactless payment trends after 2020.
- **Industry player interviews** - Engagement with key players in the financial and payments ecosystems to understand the current drivers and trends of contactless payments. The engagement process involved interview invitations to card manufacturers (4), major card networks (4), top debit/credit/prepaid issuers in the U.S. (31), and top credit unions in California (10).

### **Conclusions and recommendations**

The California Integrated Travel Project (Cal-ITP) research shows the growing adoption of contactless payments technology in the United States. This payment method has the potential to reduce friction when paying for electric vehicle charging, as it provides a faster, safer, and more convenient way to complete transactions compared to other payment technologies. The key findings and recommendations from this research report are provided below.

### **Key finding 1: The rollout of contactless payment technology in the financial ecosystem in the U.S. is well underway, and continued expansion is supported by key industry players.**

Research shows that 69% of all debit cards are already enabled for contactless payments. Rollout is also supported by 89% of key players contacted for this study that are currently issuing cards with contactless payment technology.

**Key finding 2: By 2027, virtually all cards are likely to include contactless payment technology.**

As the majority of bank cards will expire by 2027, and as major issuers deploy contactless payment technology through natural reissuance, it can be expected that essentially all cards in circulation by 2027 will be enabled for contactless payment.

**Key finding 3: The uptake of contactless payment is higher for grocery payments, where 85% of transactions use that technology.**

Contactless-related transactions in the pharmacy, retail, and restaurant/fast-food sectors have remained below 50%.

These findings imply that certain sectors might be lagging in either the adoption of contactless-enabled payment points of sale or that consumers are not yet familiar with contactless payments as an option in these forums.

**Recommendation 1: Create continuity on Senate Bill (SB) 123 regulation around the use of contactless payment for electric vehicle charging at a station.**

As SB 123 has been signed into law, we recommend regulatory bodies in California, such as the California Energy Commission maintain the current guidance on the use of contactless payments as one of the main payment methods for electric vehicle charging.

**Recommendation 2: Address potential gaps in contactless access through the transition period until 2027.**

As the transition period to wider use of contactless payments is expected to last around 4 years, we recommend the following:

- Continue engagement with other government-supported projects such as Cal-ITP that are addressing gaps related to technology adoption, equity, and mobility through work with the payments industry and government organizations. This will help share experiences and efforts in reducing barriers to paying for electric vehicle charging.
- Consider including information and resources about accessible bank accounts and other affordable financial service options that increase access to contactless payment cards in CARB program FAQs to provide more information to and streamline access for target population groups.

**Recommendation 3: Continue the use of contactless-enabled payment bank cards to provide benefits to lower-income communities that participate in CARB programs.**

Example: the California Vehicle Rebate Program (CVRP) is implementing a charge card with value of \$2,000 for program participants to use in electric vehicle charging stations, additional to the program rebate.

We recommend CARB continue the distribution of benefits through these methods, as they:

- Support interoperability between public electric vehicle charging stations
- Have the potential of bringing un- and under-banked participants closer to the financial ecosystem

## INTRODUCTION

The California Air Resources Board adopted the Electric Vehicle Supply Equipment Standards Regulation in 2019, in accordance with Senate Bill 454 (Corbett, Chapter 418, Statutes of 2013), with the goal of reducing barriers to accessing public charging stations. This regulation includes the following provisions:

- Minimum requirements for payment methods a public charging station must accept.
- Facilitates roaming agreements between electric vehicle service providers.
- Creates a more complete database of location and pricing information for consumer use.
- Ensures clarity in the cost of a charging session, among other directives.

This regulation is designed to serve not only current electric vehicle drivers but also the future generations of Californians who will use these charging systems. In 2022, CARB conducted an Electric Vehicle Supply Equipment Standards Technology Review, which highlighted the need for continued monitoring of the payments technologies ecosystem. This is necessary due to the rapid evolution of new payment methods, including contactless payments (or cEMV, which stands for contactless Europay, Mastercard, and Visa) and mobile wallets. The review emphasized the importance of gathering insights from drivers with varying income levels and access to traditional banking services to ensure inclusivity and equity in payment technology adoption.

This report aims to support the payments technologies monitoring effort by CARB by providing information on the rollout of contactless/tap-enabled debit, credit, and pre-paid cards in the United States, to support California-specific needs. This review provides insight on the level of penetration of contactless payments in the financial ecosystem.

To achieve this objective, the analysis relied on research from public sources and in-depth interviews from industry players. Where information was available, the report quantified trends related to the update of contactless-enabled, or contactless cards. The report is divided into the following sections:

- The context of contactless payments.
- The research methodology employed in the analysis.
- Findings from public data research.
- Outcomes of the in-depth interviews with industry stakeholders.
- Conclusions and recommendations for the State of California and its regulatory bodies.

This document is part of a series of three research reports carried out by the California Integrated Travel Project (Cal-ITP). The reports support CARB in investigating payment issuance and landscape, and access to payment types for electric vehicle public charging stations with an emphasis on lower-income and un- and under-banked residents. The

insights and recommendations that result from this series will help inform the California state government entities, and the general industry and stakeholders in California.

## THE CONTEXT OF CONTACTLESS PAYMENTS

Contactless EMV payment technology has had a significant impact on the way people pay for goods and services around the world. Contactless payment technology is an evolution in the payments industry, which in past decades has adopted magnetic stripe and chip technologies to provide a reliable, secure, and fast payment experience for users. Today, contactless payment is quickly becoming the standard for issuing banks and financial organizations in the United States, following similar trends observed around the world. This section summarizes the transition seen from magnetic stripe to chip to tap technologies, as well as overall trends on the retirement of older payment technologies.

For more information about worldwide contactless payment uptake trends, please refer to the CARB contactless payment access report prepared by Cal-ITP.

### From magnetic stripe to the contactless payment standard

The magnetic stripe, known as magstripe, was introduced in the early 1960s and allowed banks to encode card information onto magnetic tape laminated to the back of the card. This technology paved the way for electronic payment terminals and chip cards, offering more security and real-time authorization while making it easier for businesses of all sizes to accept cards. However, during the following decades, magstripe vulnerabilities became evident as the technology was prone to fraud and skimming attacks, where criminals would illegally install devices (skimmers) on ATMs, point-of-sale terminals, or fuel pumps to capture data or record cardholders' PINs. Criminals use the data to create fake debit or credit cards and then steal from victims' accounts.

These weaknesses came from the fact that the card information stored in the magstripe was static and easy to duplicate (Mastercard, 2021).

As a result, the Europay, Visa, and Mastercard networks worked together to develop a new standard for payment cards that uses a microprocessor chip instead of a magstripe. The standard, developed in the 1990s, proved to be safer than magstripe, as it would generate a unique code for each transaction that could not be used again. This approach made it extremely difficult for counterfeiters to clone or duplicate cards. The chip-based technology significantly enhanced the security of payment transactions, reducing the risk of fraud.

The subsequent migration to contactless payment technology witnessed significant uptake across regions, with many countries implementing regulatory measures and providing incentives to accelerate the transition. Compared to many other countries, the United States experienced a delayed adoption of contactless payment cards due to the significant investment required to upgrade payment infrastructure. However, the increasing instances of card fraud and the desire for enhanced security prompted a U.S. transition to contactless payment systems in October 2015, with the liability shift policy. This policy placed liability on the party that was least compliant with contactless Europay, Mastercard, and Visa E- systems



in a fraudulent transaction, incentivizing merchants to adopt contactless payment technology and ensure their full compliance with all contactless payment policies. (NCR, 2021)

## The uptake of contactless payment technology

While the shift to contactless payment technology significantly enhanced the security of payment transactions, it also laid the foundation for the introduction of contactless payments. Contactless payment technology uses NFC, or near-field communication (which are short-range wireless communication protocols) to enable fast and convenient transactions by simply tapping or waving a payment card, smartphone, or wearable device near a contactless-enabled terminal.

The introduction of contactless payments built upon the existing contactless payment infrastructure, allowing consumers to make secure payments without the need for physical contact or card insertion. Contactless payment cards were developed, incorporating both the chip and the near-field communication technology. This evolution facilitated seamless and faster transactions, offering a more streamlined, safe, and convenient payment experience for consumers.

## Adoption of contactless payments during COVID-19

During the COVID-19 pandemic, contactless payments increased they were regarded as a safer way to pay (Mastercard, 2020). During 2020, contactless payments in the U.S. grew 150%, compared to March 2019 (New York Times, 2020), signaling a strong trend of adoption as it required less interaction with surfaces. This increase was also fueled from the merchant side, where the uptake of contactless-enabled terminals (points of sale reached a 58% adoption, up from 40% in 2019 (NFCW, 2020).

The following sections analyze the trends observed after 2020 and discuss the policies embraced by some of the financial ecosystem industry players.

## THE UPTAKE OF CONTACTLESS PAYMENTS IN THE U.S

### Research Methodology

The methodology chosen for this analysis focused on the following two sources of information:

- **Public data** - Web-based sources that provide insights on the uptake of contactless payment in the United States. Our sample included annual reports, industry publications, press releases, marketing pieces, and other relevant materials that recounted the different contactless payment trends after 2020.
- **Industry player interviews** - Engagement with key players in the ecosystem to understand the current drivers and trends of contactless payments. The engagement process involved interview invitations to card manufacturers (4), major card networks

(4), top debit/credit/prepaid issuers in the U.S. (31), and top credit unions in California (10).

Interviews were conducted from September 2022 to January 2023. In total, the outreach process completed four interviews representing card networks, traditional issuer, credit union issuer, and prepaid issuer experience. A high number of declined interview invitations was attributed to confidentiality reasons and legal barriers that prohibited the companies in question from sharing data. Although this lack of formally submitted detail was a barrier, during the interview process the research team was able to have informal discussions with a few more issuers, confirming brief anecdotes regarding contactless payment cards.

Prior to the interview, the industry player would fill out a survey that included 17 questions covering the following topics (Appendix A):

- Data on contactless payment cards in circulation.
- Customer access to contactless payments and tap transaction data.
- Reissuance methods.
- Timeline for contactless options to be deployed In California.
- Goals and attitudes.

The team leveraged interviews to discuss survey responses regarding limitations to data collection, other challenges, useful support, and emerging market/policy trends that are of interest to each group interviewed.

## Public data review findings

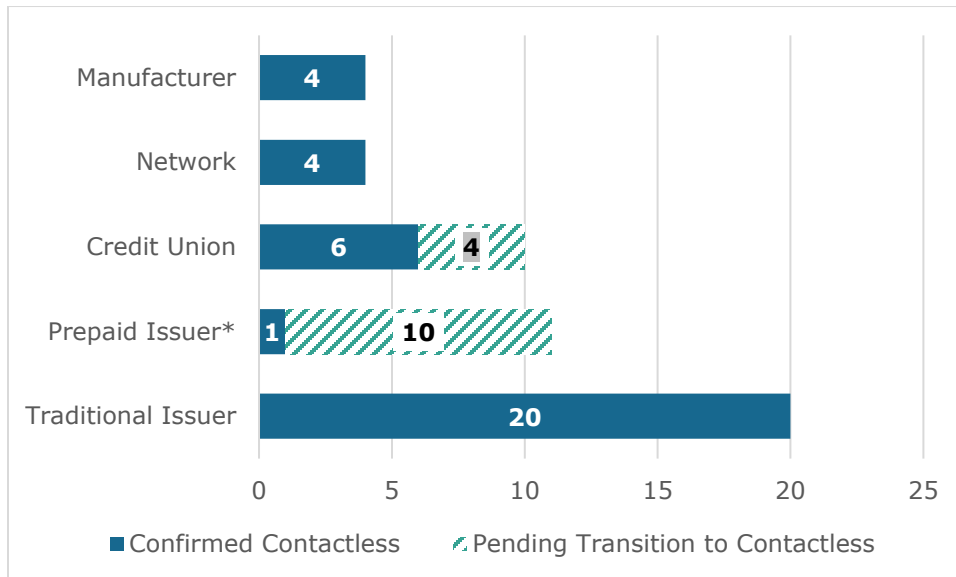
Through the comprehensive review of public sources, it is clear that contactless payments are well established among issuers and, although timing may vary, all consumers can expect this technology to reach their wallets. The current payments industry in the United States has pushed for the adoption of contactless payment technology across the ecosystem. This ecosystem is composed of:

- **Traditional issuers** - Financial institution that gives (or issues) a bank card to a cardholder (e.g., banks).
- **Prepaid issuers** - Financial entity that provides prepaid card products (e.g., employer spending card or a company gift card).
- **Credit unions** - A not-for-profit financial institution that can provide bank cards to its customers.
- **Networks** - A payment network (or payment scheme) is a company that manages the electronic transfer of funds between buyers and sellers. Payment networks are responsible for ensuring that transactions are processed quickly and securely. They also help to prevent fraud by verifying that transactions are legitimate before they are processed.

- **Manufacturers** – The entities responsible for the provision of the physical bank cards to issuers.

As shown in Figure 1, 89% of the main industry players contacted with interview requests (excluding prepaid issuers) have already transitioned to contactless payment cards. In the case of traditional issuers and credit unions, 14 out of the 26 have transitioned to contactless payment cards. This share represents an estimate of 177 million cards.

Figure 1. Industry players confirmed transition to contactless payment technology.



Source: (Nilson Report, 2022).

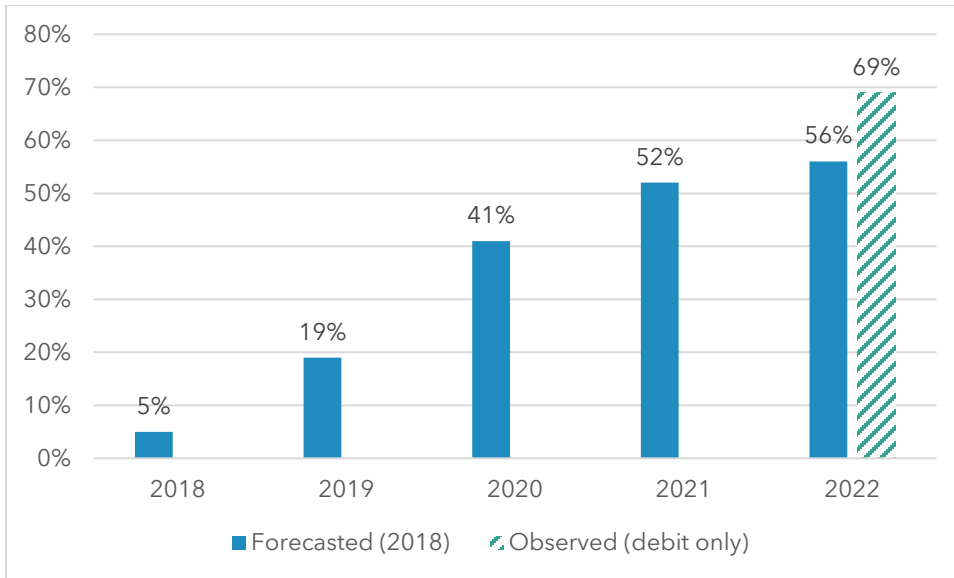
On the network level, the research found that all four networks have introduced contactless payment cards<sup>1</sup>. Visa-branded contactless payment cards alone have expanded from 100 million in 2019 to nearly 500 million in 2022, growing 500% in three years (Visa, 2023). As the largest market player, in 2020 Visa accounted for 50% of credit cards and about 74% of debit cards in the U.S. (Gabrielle, 2020).

With key industry players pushing for contactless payment technology, the adoption of contactless payment cards has increased markedly in recent years. In 2022, about 69% of all debit cards in the U.S. alone were contactless payment enabled (PULSE, 2022). This adoption rate seems above the trends forecasted in 2018, which, according to

Figure 2, estimated an adoption rate of 56% of all bank cards. This acceleration can be attributed to COVID-19 and a bigger push from market participants.

Figure 2. Percentage of contactless payment cards in force

<sup>1</sup> Visa, Mastercard, American Express and Discover



Source: Consulting US (2018) and Visa (2023)

## Card reissuance

In the context of this research, the process of card reissuance entails a card issuer replacing active chip-only cards in circulation with a contactless-enabled card. There are three reissuance definitions typically employed by the industry:

- **Natural** - Cards are replaced as they expire, are lost, or are stolen.
- **Push** - Company leads an effort to intentionally replace a subset of cards.
- **Opt-in** - Customers are allowed to elect when they will switch to contactless payments.

Although any of these methods can be used individually or even in combination, the research found through interviews that natural card reissuance is currently a preferred method from issuers for adoption of contactless payment technology in the U.S.

With natural reissuance in effect, this number is expected to steadily and rapidly increase as more issuers make the transition to contactless payments. Research and industry interviews showed that the maximum expiration time for bank cards is five years. It is expected that virtually all cards will include contactless payment technology by 2027 considering the five-year expiration time for the newest cards in the ecosystem, and assuming all re-issued cards are contactless payment-enabled.

## Transaction data

In 2023, MasterCard found that 51% of American users were tapping to pay using contactless cards or mobile wallets (White, 2023). Contactless payment adoption also varied by industry, with the following breakdown (Ibid.):

- Grocery: 85%
- Pharmacy: 39%
- Retail: 38%
- Quick service restaurants, fast food: 36%
- Transit: 9%

Although similar data across issuers was lacking, interviews supported an increase in contactless payment transactions. Through the interviews, issuers reported that overall, credit cards showed higher contactless payment taps (28%) compared to debit cards (18%). One issuer shared that they predict that credit users are more active and likely to use tap-to-pay. Credit card transactions are also more likely to be completed at larger retailers that may more likely support contactless payments.

## Mobile wallets

During the research process, publicly available data repeatedly pointed to tools beyond physical cards: the mobile wallet. Virtually all issuers in the research cohort clearly advertised mobile wallets as a contactless payment option, regardless of contactless card availability. This suggests that far more Americans currently have access to contactless payments than expected when looking at physical cards only. In fact, it's estimated that 43.2% of smartphone users already use mobile wallets (Sekulic, 2023). This payment option is especially prevalent among younger users as 67% of millennials are using digital wallets (PYMNTS, 2023).

## In-depth interviews with industry player findings

The interview process resulted in three key insights, supporting and furthering understanding of the public data review:

**Contactless roll-out is well underway.** Of those issuers who responded, all have transitioned to contactless-enabled cards, meaning that *any* newly issued or replaced cards will be enabled for contactless payments. The interviews also highlighted that the COVID-19 pandemic created card-supply challenges where smaller issuers had difficulty being supplied with cards. This situation has created delays in the rollout of contactless payment technology for some issuers.

**Natural reissuance's simple logistics are attractive.** As discussed in the above section, issuers are generally pursuing natural reissuance. This method replaces current chip-only cards with contactless payment cards as they *naturally* expire, get lost, or are stolen. The natural reissuance method was noted to have several advantages. First, natural reissuance reduces costs by allowing issuers to utilize their current chip-only cards first, thereby

minimizing wasted inventory. Secondly, natural reissuance of cards is more logistically simple. By selecting a natural reissuance method, issuers also prevent multiple cards from being active at once for a single account. From the data collected in this study, there is no evidence of issuers prioritizing one market segment over another.

**Prepaid contactless payment rollout is not comparable to traditional issuer contexts.**

Importantly, trends across prepaid issuers differed significantly, with much lower publicly available evidence of contactless payment cards. The interview process identified two distinct challenges.

1. Prepaid card issuers often work with a client who designs the prepaid card around their program needs. An example could be a retailer that issues gift cards to be used only at their shops. This situation means that retailers will not necessarily require contactless payment technology for the prepaid cards they order. This could be related to the use of older payment acceptance equipment across the industry or the lack of general interest.
2. The cost to issue contactless prepaid cards is seen as a relevant barrier to deployment in industries such as retail. Since prepaid cards are often seen as a temporary solution, the cost must make commercial and financial sense, which may not be the case for use in the retail space. Nonetheless, one prepaid issuer noted that the pronounced trend toward contactless payment cards, especially from the networks, has been a significant driver in including contactless payment cards as part of their prepaid portfolio.

## CONCLUSIONS AND RECOMMENDATIONS

The Cal-ITP research shows the growing adoption of contactless payment technology in the United States. This payment method has the potential to reduce friction when paying for electric vehicle charging, as it provides a faster, safer, and more convenient way to complete transactions compared to other payment technologies. The key findings and recommendations from this research report are provided below.

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Research shows that 69% of all debit cards are already enabled for contactless payments. Rollout is also supported by 89% of key players contacted for this study that are currently issuing cards with contactless payment technology.

**Key finding 2: By 2027, virtually all cards are likely to include contactless payment technology.**

As the majority of bank cards will expire by 2027, and as major issuers deploy contactless payment technology through natural reissuance, it can be expected that essentially all cards in circulation by 2027 will be enabled for contactless payment.

**Key finding 3: The uptake of contactless payment is higher for grocery payments, where 85% of transactions use that technology.**

Contactless-related transactions in the pharmacy, retail, and restaurant/fast-food sectors have remained below 50%.

These findings imply that certain sectors might be lagging in either the adoption of contactless-enabled payment points of sale or that consumers are not yet familiar with contactless payments as an option in these forums.

**Recommendation 1: Create continuity on Senate Bill (SB) 123 regulation around the use of contactless payment for electric vehicle charging at a station.**

As SB 123 has been signed into law, we recommend regulatory bodies in California, such as the California Energy Commission maintain the current guidance on the use of contactless payments as one of the main payment methods for electric vehicle charging.

**Recommendation 2: Address potential gaps in contactless access through the transition period until 2027.**

As the transition period to wider use of contactless payments is expected to last around 4 years, we recommend the following:

- Continue engagement with other government-supported projects such as Cal-ITP that are addressing gaps related to technology adoption, equity, and mobility through work with the payments industry and government organizations. This will help share experiences and efforts in reducing barriers to paying for electric vehicle charging.
- Consider including information and resources about accessible bank accounts and other affordable financial service options that increase access to contactless payment cards in CARB program FAQs to provide more information to and streamline access for target population groups.

**Recommendation 3: Continue the use of contactless-enabled payment bank cards to provide benefits to lower-income communities that participate in CARB programs.**

Example: the California Vehicle Rebate Program (CVRP) is implementing a charge card with value of \$2,000 for program participants to use in electric vehicle charging stations, additional to the program rebate.

We recommend CARB continue the distribution of benefits through these methods, as they:

- Support interoperability between public electric vehicle charging stations
- Have the potential of bringing un- and under-banked participants closer to the financial ecosystem



## Appendix A - Sources

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## Appendix B - CARB Contactless Payments Market Penetration Survey

Copy of the survey questionnaire sent to industry players.

### CARB Contactless Payments Market Penetration Survey

The California Integrated Travel Project (Cal-ITP) is currently working on an engagement with the CARB to look into the general availability of contactless cEMV bank cards to banking customers. Particularly, this research will help to inform CARB's policy with respect to payment requirements for electric vehicle charging stations. Further, this research has the potential to inform decisions across industries, especially with respect to understanding where there may be gaps in market coverage. The research will focus on establishing a baseline and understanding the mechanics of reissuance across the landscape of major payment card issuers.

We are reaching out to payment card issuers through this survey to gather any information available regarding the status and timeline for the transition from chip to contactless cards. Your insights are greatly valued, and we appreciate your participation in this emerging research. Results from this survey will be anonymized and aggregated before any reporting.

For technical problems or to schedule a more in-depth discussion, please contact [redacted].

1. Please indicate what network(s) and issuer(s) you represent.

#### Contactless Card Data - Cards in Circulation

***If responding for multiple issuers/networks, please indicate which organization the reported data corresponds to.***

2. How many **contactless** cards are in circulation and active? Please provide these figures for prepaid, debit, and credit respectively if available.
3. How many total cards are in circulation and active? Please provide these figures for prepaid, debit, and credit respectively if available.
4. How does this compare to a year ago, two years ago? Please provide these figures for prepaid, debit, and credit respectively if available.

#### Contactless Card Data - People and Transactions

***If responding for multiple issuers/networks, please indicate which organization the reported data corresponds to.***

5. Do you have an estimate of how many customers the previous numbers represent?
6. How many of your customers have no ability to pay with a contactless card?
7. What percent of transactions are made via swipe, chip, and contactless? Please provide these figures for prepaid, debit, and credit respectively if available.
8. What percent of low-cost transactions (under \$60) are made via contactless taps? Please provide these figures for prepaid, debit, and credit respectively if available.

#### Reissuance Information

*If responding for multiple issuers/networks, please indicate which organization the reported data corresponds to.*

*Reissuance refers to how active cards in circulation are replaced with contactless versions. There are three main methods:*

- *Natural - based on expiration date and loss of one's card*
- *Push - company leads an effort to intentionally replace a subset of cards*
- *Opt-in - customers are allowed to elect when they will switch to contactless*

9. What reissuance method(s) have you used so far?
10. When was the last time a **non-contactless** card was issued?
11. What is the maximum amount of time that a card is active before its expiration date?

## Projected Timeline to Full Contactless

*If responding for multiple issuers/networks, please indicate which organization the reported data corresponds to.*

12. Confirm a likely timeline for full contactless.
13. Are you prioritizing specific market segments or account types over others? If yes, explain.

## Attitudes

*If responding for multiple issuers/networks, please indicate which organization the reported data corresponds to.*

14. Why was the reissuance method(s) selected? Any challenges or advantages?
15. What kind of external support has been or would be most helpful in the transition to contactless? What other issuance barriers exist?
16. What are your organization's near-term and long-term goals/attitudes toward contactless payments?
17. What educational materials are available to customers regarding mobile phone payments as a contactless method?

Thank you for your participation!

We will be in contact to discuss future updates. In the meantime, please feel free to contact **[redacted]** for questions and comments. We appreciate your time and insight.