Presented by:

The ETA Mobile
Payments Committee

The State of Mobile Payments in 2019

Introduction

Mobile payments are the next frontier in commerce and open a whole new realm of possibilities for the way we transact with one another. Our mobile devices (phones, smartwatches) are the hub of nearly all our daily activities, and they have the potential to become the nexus of all our commercial interactions as well. When the payment form factor is a mobile device, instead of a card (or a check, or cash), all the contextual information – like rewards numbers, coupons, payment history – can be automatically loaded onto the transaction, allowing for a customized, data-driven user experience. Geo-location lets merchants deliver targeted notifications and offers. Transaction history information means better product recommendations. Social media integrations make peer-to-peer payments an easy and natural part of online interactions. Every isolated action can become a data point, part of a larger, unified picture of the consumer. And it all happens in the background: one authenticated tap and it's securely done.

Consumers have a lot to gain from embracing mobile payments, not least of which is the sheer number of payment options. There are many different ways to pay with a mobile device, from dedicated peer-to-peer payment apps like Venmo and Square Cash, to payment capability embedded in retailer apps like Starbucks' mobile app, to QR-code based apps like Alipay and WeChatPay, to tap-and-pay mobile wallets like Apple Pay, Google Pay and Samsung Pay. In-app mobile payments, whether in the context of gaming or retail, are another fast-growing segment, as are payments made at a mobile Point of Sale (mPOS) like those offered by Square or CardFlight.

One major difference between mobile wallets is whether they are "closed-loop" or "open-loop." Closed-loop mobile wallets or apps can generally only be used at specific merchants – the user pre-loads funds into the app and then uses that balance to pay at the point of sale. Alternatively, an open-loop wallet stores the user's credit or debit card credentials and uses those to complete the payment transaction at the point of sale. Open-loop mobile wallets work at any merchant terminal that is enabled to accept mobile payments.

The other major difference is whether the wallet uses "tap-and-pay" technology (contactless) or "scan-and-pay" (barcode or QR code). In the U.S., most mobile payments use tap-and-pay contactless technology, although there are a few apps that use QR codes as well. In this report, we will focus on contactless transactions at the point of sale that are made using a mobile device. A mobile device can be a phone, watch, or other wearable like a fitness band. The most commonly used contactless transmission technology for these types of payments is known as Near Field Communication (NFC). Apple Pay, Google Pay, and Samsung Pay all use NFC. Samsung Pay also uses Magnetic Stripe Transmission (MST) technology that allows it to work with non-contactless (i.e. swipe) terminals.
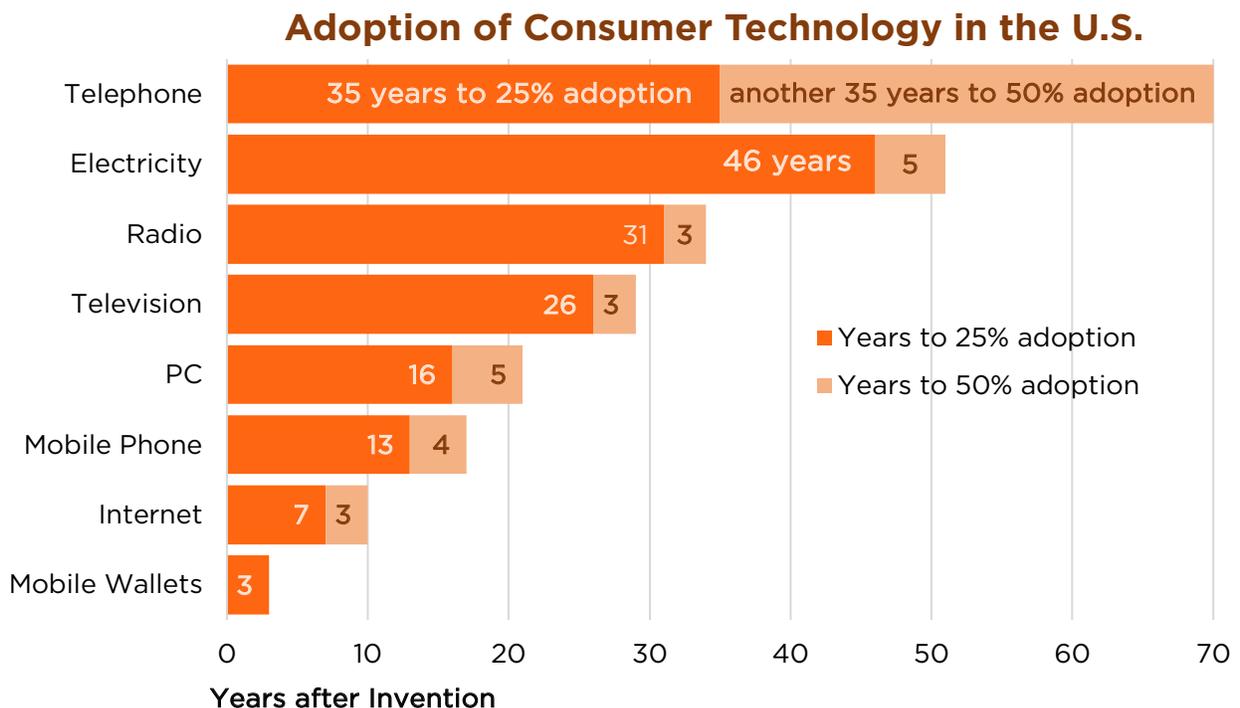
The goal of the Electronic Transactions Association, and of the payments industry in general, is that, to the average consumer, paying with a mobile device becomes as natural as swiping/dipping a card or pulling out a dollar bill.

State of consumer adoption now

In 2018, 55 million people in the U.S. used their smartphone to make a payment at a physical point of sale, whether by loading money into a closed-loop mobile app (like the Starbucks app) or by loading a credit or debit card into an open-loop mobile wallet (like Apple Pay, Google Pay, or Samsung Pay) and using it to pay at the point of sale. These 55 million users account for about 20% of the U.S. population aged 15 and over, and just over 25% of U.S. smartphone users.

Mobile payments are becoming increasingly familiar to U.S. consumers, but we're not quite at mass adoption. Consumer insights firm CivicScience reports that, as of February 2018, while 10% of users surveyed had made a mobile payment in the past month, only 1% used mobile payments as their primary payment method.

That said, new technology takes time. For instance, the telephone was invented in 1876. It wasn't until 1911, a full 35 years later, that 25% of consumers in the U.S. had a telephone. It took another 35

Adoption of Consumer Technology in the U.S.

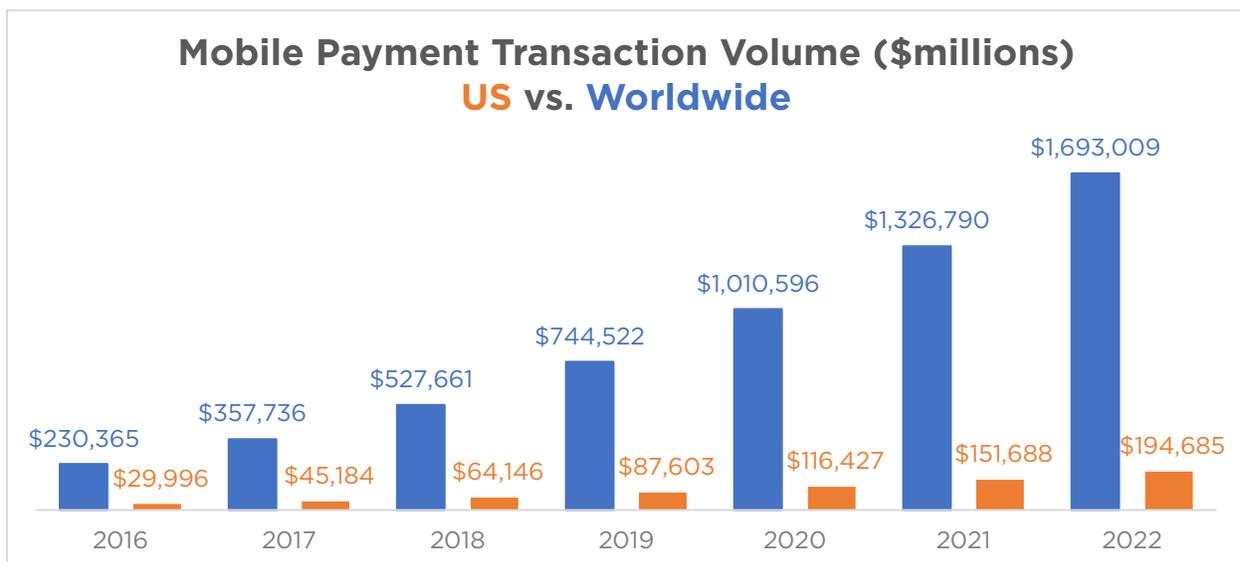| Technology	Years to 25% adoption	Years to 50% adoption
Telephone	35 years to 25% adoption	another 35 years to 50% adoption
Electricity	46 years	5
Radio	31	3
Television	26	3
PC	16	5
Mobile Phone	13	4
Internet	7	3
Mobile Wallets	3	

Years after Invention

years after that to reach 50% consumer adoption. Similarly, electricity took 46 years to reach 25% adoption. Of course, more recently, the adoption curve for new consumer technology has been shorter. The Internet, formally invented in 1991, took seven years to reach 25% of consumers, but only three years after that to reach 50% of consumers. The mobile phone took 13 years to reach a quarter of consumers, while the personal computer (PC) took 16 years.

By comparison, Apple Pay was officially launched on October 20, 2014 – four and a half years ago. Android Pay launched on September 10, 2015 (three and a half years ago), while Samsung Pay launched in the U.S. on September 28, 2015. 15 months later, in January 2017, one in five U.S. consumers (19%) was enrolled in one of those three products. There have been other, retailer-specific mobile payment apps and SMS-based remote payment capabilities on the market before. But these three OEM Pays (i.e. apps provided by the Original Equipment Manufacturer, rather than a third party) represent a pivotal moment in the development of mass-market, pay-anywhere mobile wallets.

The future of mobile payments, both in the U.S. and around the world, will likely be determined by the success of the OEM Pay wallets. Data from Juniper Research indicates that there will be 450 million OEM Pay wallet users worldwide by 2020 (including but not limited to Apple Pay, Google Pay, and Samsung Pay), spending over $300 billion using their mobile devices. The Statista Digital Market Outlook estimates that by 2020, total mobile contactless POS payment transactions will exceed $1 trillion worldwide and $115 billion in the United States.

"Early adopters" can serve as effective grassroots promoters for the new technology. And as mobile wallets continue to enable peer-to-peer payments capabilities (currently Apple Pay and Google Pay offer peer-to-peer payments), they create opportunities for early adopters to broadcast mobile payment technology to their social networks and introduce it to their friends and family as a trusted source. From 2016 to 2022, mobile payment transaction volume in the United States is projected to grow 36.6% year over year. While this is a substantial increase, the rate of growth in mobile payment volume is actually tapering off and will continue to do so over the next few years. For instance, mobile payment volume in the United States grew 50.6% from 2016 to 2017, 42% from 2017 to 2018, and is projected to grow just 36.6% from 2018 to 2019. This matches the worldwide pattern as well.

In 2018, U.S. consumers spent $64 billion on mobile devices, up 42% from the $45 billion they spent in 2017. In 2019, consumers are projected to spend nearly $88 billion.

Mobile Payment Transaction Volume ($millions) US vs. Worldwide

| Year	Worldwide	US
2016	$230,365	$29,996
2017	$357,736	$45,184
2018	$527,661	$64,146
2019	$744,522	$87,603
2020	$1,010,596	$116,427
2021	$1,326,790	$151,688
2022	$1,693,009	$194,685

Source: Statista Mobile POS Payments Digital Market Outlook

Mobile payments adoption: the numbers

Although we are still in the early stages of adoption, the sheer size of the United States market means that there is a substantial base of mobile payment users already. As we saw in the previous section, eMarketer reports that 55 million U.S. consumers used their phone to make a payment at a physical point of sale last year. This includes all types of proximity mobile payments, including cases in which the user pre-loads funds into an app and uses that balance to pay at the point of sale (this is generally how the Starbucks mobile app works, for instance). Closed-loop mobile applications like these are often tied to loyalty and rewards programs offered by specific retailers.

Open-loop mobile wallets work by using a digitally stored credit or debit card or, in some cases, by triggering an online bank transfer. They are referred to as "open-loop" because they do not require the user to have a pre-existing balance in the mobile wallet – they can be used just like a credit or a debit card. There were 26 million active users of open-loop mobile wallets in 2018, according to research firm Statista, representing about 8% of the total population and 11% of smartphone owners. By 2023, roughly 38 million people in the U.S. will be using mobile payments. The user base is expanding steadily and keeping up with population growth. If current projections hold, **11% of the population will be using mobile payments by 2023**, less than a decade after the launch of Apple Pay in the United States.

When looking at mobile payment users as a percentage of smartphone owners, Payments Journal reports that usage peaked in 2016, with 30% of smartphone-owning adults using a "universal mobile payment app" such as Apple Pay, Android Pay or Samsung Pay; in 2018, only 23% of smartphone owners used such mobile payments apps. Expanding the definition of mobile payments users to include users of retailer or single-merchant apps (such as Starbucks Pay), 48% of smartphone-owning adults were mobile payments users in 2018, down from 53% in 2016.
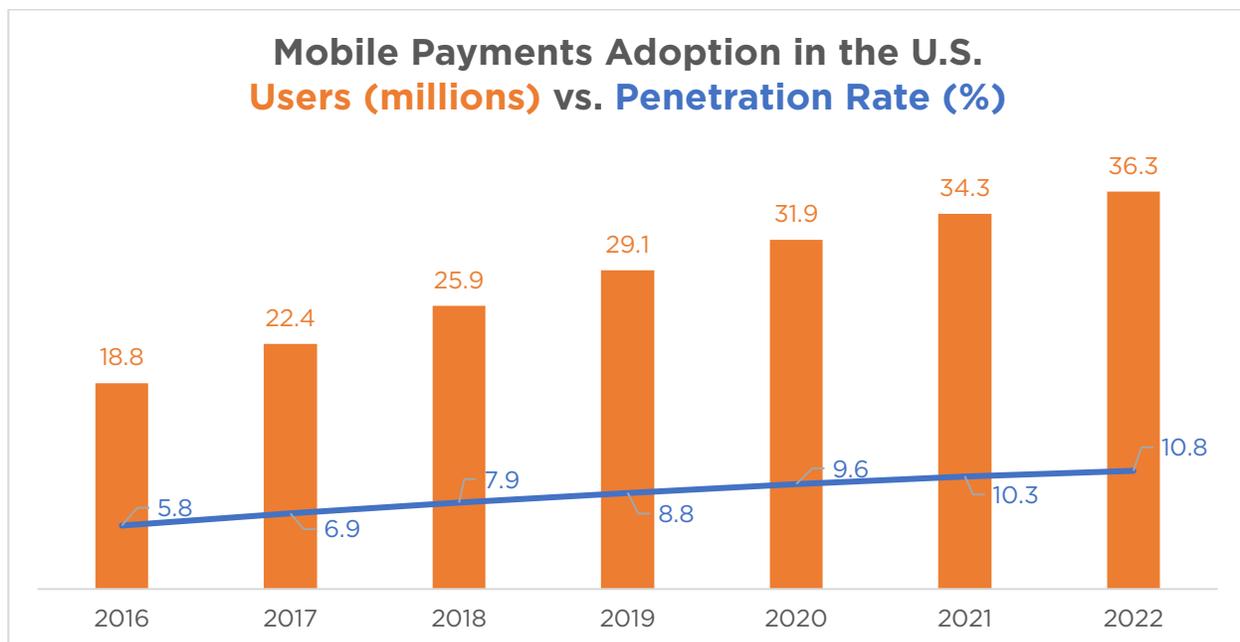
Source: Statista Mobile POS Payments Digital Market Outlook

United States consumers spend more money using their mobile devices than any other country except China. In 2018, mobile payment transaction volume in the United States reached **$64 billion** – a tiny fraction of total consumer spending (about $40.5 trillion in 2018), to be sure – but second only to the **$414 billion** in mobile payment volume in China.

Mobile Payment Transaction Value by Market ($billions)
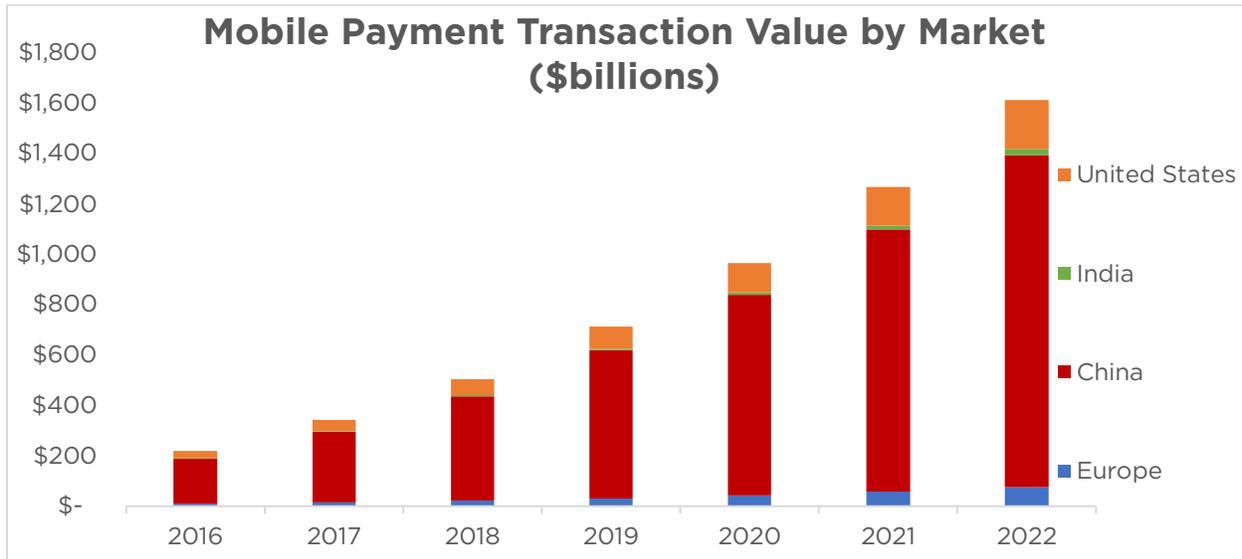
Source: Statista Mobile POS Payments Digital Market Outlook

The case for contactless mobile payments

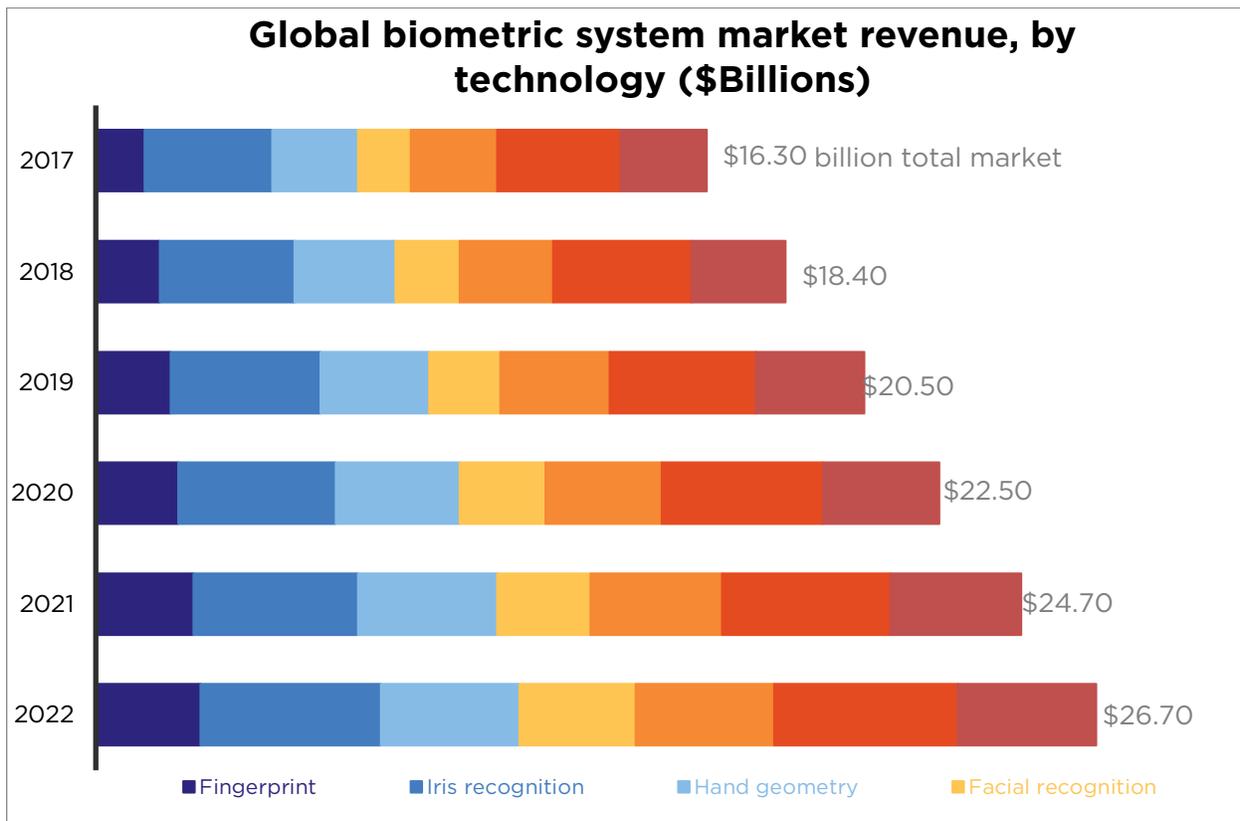There are two primary advantages to mobile payments:

1. Security

2. Convenience

Mobile payments enable a host of new security features, like tokenization and biometric authentication, that make mobile payments one of the safest ways to pay on the market.

Firstly, mobile payment transactions are **tokenized**, which means that the user's actual card number is never seen by the payment terminal. Instead, they send a token (typically a random string of numbers) that represents that card number. The token is generated by a server that only the mobile wallet application and the merchant acquirer can access. That means that the merchant terminal never sees the card number. Even if someone were to somehow intercept the transmission of the card data from the mobile wallet to the terminal, they would only get a random string of numbers. Without the secure token server to match the token to the card number, the intercepted information is useless.

Secondly, the merchant's terminal will **encrypt** the payment data as soon as the mobile device is tapped, just like it encrypts a swiped or dipped card transaction. The payments industry, through the Payment Card Industry (PCI) Security Standards Council, maintains stringent requirements for the proper encryption of payment card data from the moment it leaves the cardholder to when the payment is finally cleared and settled. The aim of PCI's Point to Point Encryption (P2PE) standard is to **devalue cardholder data** so that there is nothing useful for hackers and criminals to steal.

The third layer of security is **biometric authentication**. New mobile devices are increasingly equipped with biometric authentication features, from increasingly sophisticated forms of fingerprint scanning (like Touch ID) to iris scanning and facial recognition (like Face ID). Other sectors, such as healthcare and immigration, are increasingly adopting biometric authentication, such that consumers are increasingly aware of and comfortable with the technology. The global biometrics market is projected to grow to $32.5 billion by 2022 from $21.8 billion in 2018, growing at a rate of roughly 14% per year. Biometric authentication is both more secure than traditional forms of authentication like passwords (which are frequently re-used and easily guessed) and security questions. It also requires less effort on the part of the user. And while in 2018, 65% of biometrics-capable devices enabled biometrics for payment transactions, by 2022 it is expected that over 97% will. While fingerprint recognition may be the biometric form most people have heard of, iris and signature recognition are projected to have nearly twice the market revenue of fingerprints by 2022.

Global biometric system market revenue, by technology ($Billions)

Year	Total
2017	$16.30 billion total market
2018	$18.40
2019	$20.50
2020	$22.50
2021	$24.70
2022	$26.70

Legend: ■ Fingerprint ■ Iris recognition ■ Hand geometry ■ Facial recognition

Source: Lucintel and Statista Estimates, October 2018

Mobile payments are convenient because they allow users to manage every aspect of their consumer experience in one place. To start, most mobile payment apps allow users to add as many cards as they want and select a default one that can be used to make a payment without opening the app. Users can integrate their loyalty and rewards accounts directly into the payment app and load coupons.

And mobile payments truly allow users to "tap and go." There's no inserting the card and waiting for the transaction to finish. According to Gemalto, an EMV transaction can take up to 30 seconds from beginning to end, whereas contactless transactions take about 13-15 seconds. With the rise of payments-enabled wearables, a market worth $2.9 billion in the U.S. alone in 2018, the transaction

becomes even simpler. Further strengthening the "tap and go" experience is the issuance of contactless cards in the U.S., with all major issuers either already or soon to be providing these cards to their customer base. Nearly all new terminals shipped in the United States can accept mobile payments. As customers become more familiar and comfortable with tapping these physical cards, it seems only logical that a large proportion will make the leap to provisioning these cards into their mobile devices to take advantage of the speed, security, and ease of use.
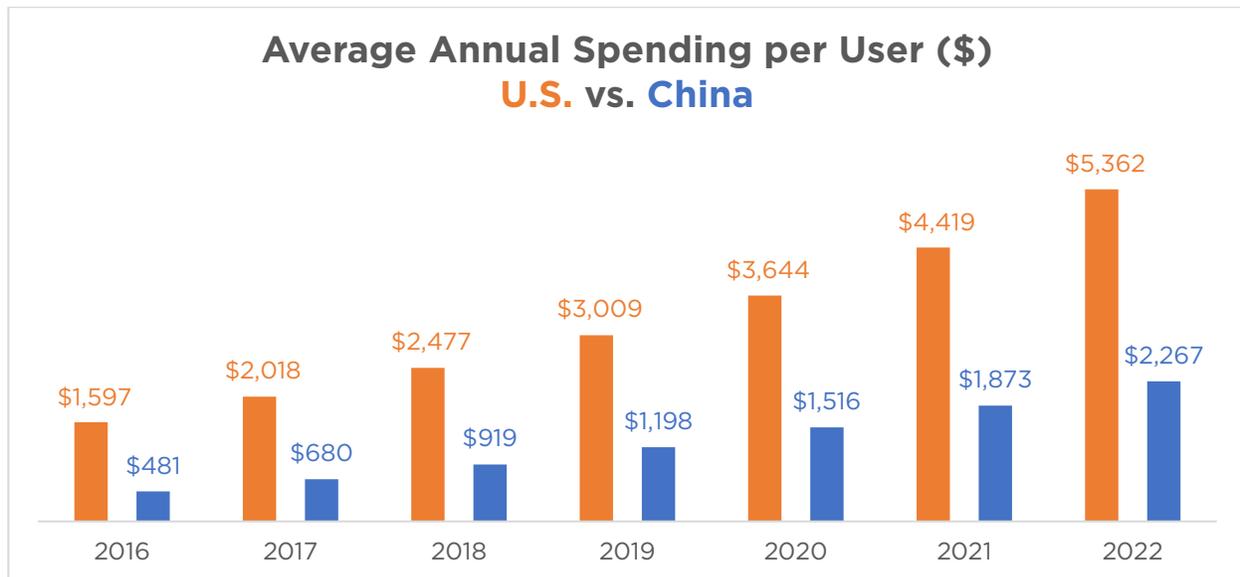
Barriers to broader adoption of mobile payments

Despite the strong consumer case for adopting mobile payments, as well as promising growth in volume over the last few years, there are several factors impeding the progress of mobile proximity payments. Ironically, one of the primary concerns that consumers share about mobile wallets is that they are less safe than their physical credit and debit cards. According to CivicScience, 47% of respondents said that "security fears" were the primary factor preventing them from using mobile payments. People worry that their phone is somehow broadcasting their card number, or that if someone gets close enough, they can just skim their card data right off their phone. As we have seen, nothing could be further from the truth. The mobile wallet replaces the card number with a token, so even if it is intercepted, there is nothing a criminal can use. Younger users tend to be more comfortable with mobile payments. 23% of millennial respondents (aged 18-34) said there were no factors preventing them from using mobile payments, compared to 18% of GenX respondents (aged 35-54), 8% of Baby Boomers (aged 55 and older), and 17% of all respondents across the board. Still, a plurality of millennial respondents (40%) cited security concerns – a smaller share compared to older respondents but still their primary cited reason for not using mobile payments.

In a sense, the payments industry has been a victim of its own success – cards are easy enough to use that many consumers see no reason to upgrade. Payment processor TSYS found that in 2018, 44% of consumer respondents preferred to pay with debit cards, compared to 33% who preferred credit cards and 12% who preferred cash. Worldpay's World Payments Report found that credit cards made up 41% of POS spending by value in North America last year, with debit cards following close behind at 34%. And with an estimated 9 million U.S. merchants accepting at least one form of credit or debit card (Visa being the most common), paying with a card is easier than ever.

In 2015, the U.S. payments ecosystem officially migrated to EMV chip cards, with a mandate for merchants to upgrade their terminals to accept them or else face liability for the types of fraud that chip cards prevent, such as counterfeit card fraud. While many EMV-compliant terminals also accept mobile payments, allowing merchants to achieve both upgrades in one go, the focus on EMV upgrades meant that enabling mobile payments was less of a priority. In some cases, this meant "switching on" the mobile payments feature of an EMV-compliant terminal; but other terminals require more intensive reprogramming or even replacement. Some merchants were unwilling to make these changes so soon after switching their systems over to accept EMV cards. Other merchants, whose customers do not frequently use mobile payments, may be waiting for greater adoption of mobile payments on the consumer side before upgrading their terminals to accept them. As we saw in the previous section, the growth of contactless cards – both on the issuing and the acquiring side – may encourage merchants to adopt mobile payments as part of a contactless re-terminalization effort.

Mobile payments usage

In 2018, the average mobile payment user in the U.S. spent $2,477.20 through their mobile wallet. This average value is projected to increase by about 21% to $3,008.80 in 2019. While this is a substantial increase, it suggests that mobile payments will not become the primary payment method for most consumers in the next few years. Data from the Bureau of Labor Statistics indicates that average consumer spending per household (shown as "consumer unit in the link) was $60,060 in 2017.

Average Annual Spending per User ($)
U.S. vs. China

Year	U.S.	China
2016	$1,597	$481
2017	$2,018	$680
2018	$2,477	$919
2019	$3,009	$1,198
2020	$3,644	$1,516
2021	$4,419	$1,873
2022	$5,362	$2,267

Source: Statista Mobile POS Payments Digital Market Outlook

Researchers at the University of Illinois found that consumers in China spent 2.4% more money after switching to a mobile wallet – and, perhaps more importantly, made transactions 23% more frequently. They also tended to make more food, entertainment, and travel purchases. And as might be expected, they tended to use their mobile wallets to make low-cost, high-frequency purchases like coffee. This pattern is beginning to emerge in the U.S. A study by Auriemma Consulting Group found that Walmart shoppers that used either Walmart Pay or Apple Pay – or both – spent significantly more each month that shoppers without a mobile payment app.

Consumers are beginning to use mobile payments in other contexts as well. A study by Adobe found that more than a third of Cyber Monday sales in 2018 took place on mobile devices. Cyber Monday drove $7.9 billion in online sales, with $2.83 billion – 36% - made on mobile devices. Consumers are increasingly making their shopping decisions on mobile platforms, with nearly 55% of visits to retail sites coming from mobile devices, so it makes sense that more people want to finish their purchases on the same device they started.

Conclusion

There are many reasons to be optimistic about mobile payments, particularly in the U.S. Mobile payment transaction volume has shown promising growth, and by now a vast majority of consumers are aware of mobile wallets as a payment option. In the last few months, prominent retailers like Target and 7 Eleven have announced they will accept mobile payments at the point of sale. There are increasingly fewer large merchants that have not yet adopted mobile payments. But even small merchants have more tools at their disposal than ever to quickly, safely, and conveniently start accepting mobile payments.

Consumer education plays a strong role in driving adoption, as a shopper's level of comfort determines how likely they are to pull out their phone instead their wallet at the point of sale. Merchants can do a lot to educate their staff and customers on how mobile payments work. ETA has released a short guide showing how small and medium businesses can accept mobile payments, available on our website. As payment and retail technology evolve to enable new consumer experiences, we are confident that mobile devices will be at the center.