Visa Consulting & Analytics

How contactless is reinventing the way people pay

Disclaimer

Contactless is a faster, easier and more secure way to pay

Contactless is a quick, easy, and secure way to pay, which is perceptibly faster and more convenient than paying by cash. By the beginning of 2020, contactless accounted for more than a third of the world's face-to-face Visa transactions. In some regions, the share of contactless transactions was approaching three-quarters. In many emerging economies, contactless has also become well established, and can account for more than a third of Visa transactions.

We can therefore say with real confidence that:

- Contactless has made a sudden and significant difference to the way that hundreds of millions of people pay – in many countries around the world, contactless has quickly become deeply embedded into everyday payment habits, critical mass has been achieved in many other countries, and many more are following fast.
- Much has been learnt in the 15 years since contactless was introduced – in terms of the prerequisites for successful deployments by EMVCo, the barriers to be overcome, as well as the opportunities to be pursued.
- These learnings are valuable for the regulators, the payments industry, the merchant community, and other stakeholders – both in extending the reach of existing contactless deployments and in planning future programmes as the desire for cashless societies grows.

Consequently, this paper provides:

- A brief overview of why contactless is being implemented and the benefits it brings to all parties.
- An update on the current global status of contactless, and case studies regarding some of the most successful deployments.
- Broad suggestions of how progress can be accelerated in new and emerging contactless markets.

What is contactless?

Contactless is a secure, digital technology based on EMV, the global standard for smart cards.

It can be deployed on payment cards, mobile phones and many other devices such as wearables. And its aim is to make payments quicker and more convenient – while keeping them secure.

Consumers pay by simply 'tapping' or 'hovering' their card or device when prompted by the terminal.

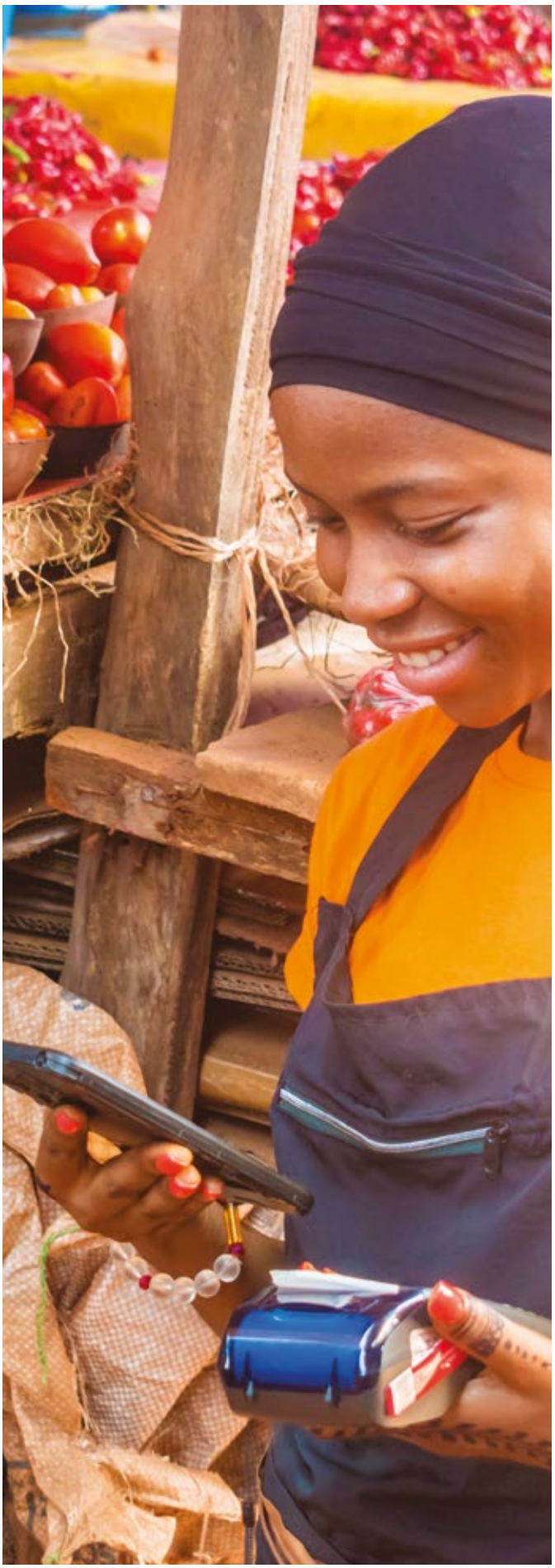
How does contactless work?

Contactless payments use short-range wireless technology.

A tiny antenna is embedded into the card, phone or wearable device, which securely transmits payment information to and from the contactless reader.

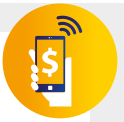
For the payment to work, the card or phone must be held within 4cm of the secure contactless reader. It then takes less than half a second for the reader to receive the card details.

Typically, the total transaction time is less than 6 seconds (including authorization, printing and handover of the receipt). It is therefore perceptibly faster and easier than paying by cash – and is considerably more secure.



Why contactless?

There are several reasons why contactless technology is strategically significant for the payments industry, and also for governments and regulators. These include:



Out-competing cash

Cash still accounts for the majority of payments in many countries. Yet, as well as being inefficient to process and expensive to sustain, cash is inherently insecure, and its use fuels the shadow economy. The displacement of cash is therefore a strategic objective for many governments, banks, payment providers and, increasingly, merchants.

Contactless represents, a viable cash displacement tool – which is perceptibly faster, more secure, and more convenient than using notes and coins.

Providing a viable alternative to 'cash-heavy' merchants

In those merchant environments with high payment volumes and low ticket-values, the use of cash has been deeply entrenched. Examples include quick service restaurants, coffee bars and convenience stores – as well as mass transit, parking and vending operators.

As we discuss in this paper, contactless can bring tangible value to all merchants, but especially cash-heavy merchants – enabling them to serve their customers more quickly, reducing line-ups, encouraging higher transaction values, and minimizing the risks and costs of cash-handling.

Improving the everyday experience for consumers

For consumers, using contactless is fast, convenient and secure. It means less line-ups, faster payments, and it eliminates the need to search for coins and notes.

Contactless is successful around the world because it offers real convenience, especially for ticketing and purchases in fast-food outlets, express stores, cafes, newsagents, buses, trains, parking and vending machines – all the places where the cash turnover is usually high and consumers are usually in a hurry.

Creating value for payment providers

Most banks would agree that a more engaged customer tends to be more satisfied and also more profitable. For example, VisaNet data from around the world suggests that a payment card is the primary indicator of account performance, because regular users of payment cards tend to be more satisfied, more loyal, maintain higher balances, and more likely to hold additional financial products with their primary bank or financial institution.

Contactless technology gives cardholders more reasons and more opportunities to use their cards more frequently – consequently they are likely to be more loyal and their card is more likely to be 'front of wallet', meaning that their banking relationship is more commercially viable and sustainable.

Paving the way for many different form factors and innovations such as The Internet of Things (IOT)

The issuance and acceptance of contactless cards opens the door to payments from many other form factors such as smartphones and wearables. The same underlying technology is used to process transactions, including acceptance devices and the related technical infrastructure.

The potential for mobile and wearable-enabled payments is significant.

Providing an interoperable platform for open participation, healthy competition, and regulatory oversight

A clear advantage of contactless payments is that they operate as part of the four-party payment system. This means that any licensed bank or payment provider can participate as either an issuer, an acquirer, or both, and many different technology providers and vendors can deliver solutions, which increases the network effects, guarantees interoperability, and enables healthy competition.

As opposed to some alternative payment mechanisms, the four-party payment system is open to any number of participants. It is designed to enable competition, and enables governments to maintain clear regulatory oversight.

Bringing increased security to everyday payments

All contactless transactions are protected by the same secure encryption technology as any type of chip transaction. Several additional safety measures are in-built. With mobile contactless payments like (Apple Pay and Android Pay), technologies like tokenization and biometrics can bring a further layer of security. Because, the card or device doesn't need to leave the consumer's hand there is no scope for additional card details (such as the security code or CVV) to be compromised. And, of course, for consumers and merchants alike, contactless is far safer than using cash.

Although there are some common myths and misunderstandings about the theoretical risks of contactless, the technology is in fact highly secure. An important part of the global success of contactless is the protection it brings to every party – consumer, merchant, acquirer, and issuer.

A safe, secure way to pay – with in-built protection for consumers

Across the world, questions continue to be asked about the security of contactless – and certain myths have emerged about the level of protection provided to consumers, and the potential for fraudsters to intercept account details.

In fact, contactless cards use the same secure technology as any other Visa chip card. In addition, cardholders remain in control of their cards or devices during the entire transaction, further reducing the risk of fraud. This makes it inherently secure. And Visa clients (such as issuing banks and acquirers) have not reported any increase in fraudulent activity as a result of implementing contactless since its public launch way back in 2004.

Inherent security for transactions

Visa contactless transactions are protected by very high security standards and risk management processes, with a combination of technologies on the card and on the Visa processing network working together to prevent fraud. For example:

- Contactless uses highly secure EMV technology and standardized encryption technology.
- The payment must be prompted by the merchant, and the device must be less than 4cm away from the terminal – there is a very short read range.
- Use of strong cryptographic keys and techniques on every transaction – each card has its own unique built-in secret "key" which is used to generate cryptograms that uniquely identify each transaction, no two cards share the same key, and the key is never transmitted.
- At the systems level, the Visa payment network can automatically detect and reject any attempt to use the same payment information more than once.
- Even if a criminal somehow manages to "read" a contactless transaction, any information they obtain cannot be used to make a fraudulent contactless transaction, nor can it be used to make a working counterfeit chip card.

Together, these protections mean that Visa contactless cards are as safe as traditional chip cards – and arguably far safer than cash.

Built-in protection for consumers

All of Visa's operating rules have been created with consumer protection in mind.

The specifics of consumer liability may differ slightly from bank-to-bank or provider-to-provider. But, when they participate in the Visa system, all clients agree to a baseline level of consumer protection (such as protection from fraud and the right of repudiation) which often goes well beyond prevailing national regulatory requirements.

Addressing those nagging doubts about risk

Even in countries where the use of contactless is well-established, there continue to be some common myths and misunderstandings over risk. In the UK, for example, where the use of contactless is deeply embedded, 55% of consumer still express concerns about its security and almost a third say they are so concerned that it puts them off using contactless at all.[1]

So, as with any implementation program, it is important to address these head-on.

Some of the most frequent include:

Could I be debited twice if I have more than one contactless card?

Cardholders are often concerned that their account could be debited more than once for the same transaction. This can't happen, because contactless readers are specifically designed to communicate with only one card and perform only one transaction at a time. If the reader identifies more than one contactless card in your wallet or purse, you will be asked to select one card to pay. A single transaction must be completed, or cancelled, before a second payment can be initiated.

Could I unknowingly have made a purchase if I walk past the reader?

Despite cardholder concerns, this is not possible. The card has to be waived within 4cm of the card reader for more than half a second and the retailer must have first entered the amount for you to approve. Terminals can only process one payment transaction at a time, therefore reducing transaction errors.

Could a fraudster use a reader to steal my card details?

Theoretically, it may be possible (but highly unlikely) for a fraudster to intercept some card details using contactless. But, they wouldn't bother. Because, from a fraudster's perspective, the card details are incomplete. There's not enough data transmitted to attempt to make a fraudulent transaction (for example, there's no security code or CVV2). And there's certainly not enough to make a functioning counterfeit card.

What if my card is stolen? Would a fraudster be able make any number of contactless transactions?

If your card is stolen, you should report it as soon as possible, so that your bank can prevent any further transactions from being authorized. But, don't worry, you will be protected. Contactless technology has many built-in protections to guard against the loss or theft of your card (as a consumer, you should ask your bank for details).

[1] MoneySavingExpert.com. 2018. Future Thinking And Equifax.
Available at: <https://www.moneysavingexpert.com/news/2018/09/equifax-fined-p500-000-for-failing-to-protect-customer-data/>.

The state of play globally

As of the start of 2020, one-in-every-three point of sale transactions that runs over Visa's network is contactless, versus one-in-every-four at the start of 2019.

There are almost 50 countries, where contactless payments represent at least a third of all face-to-face transactions.

And, according to Juniper research, the total market for contactless (comprising all of the global payment schemes), is set to grow at a compound annual growth rate of 34% through to 2023.[2]

It should be noted that the global figures are distorted by the fact that the US market is lagging behind much of the world. If the US market is removed from the picture, the figures are even more impressive – with contactless transactions accounting for more than a half (54.5%) of all Visa face-to-face transactions.[3]

Also, the story is much bigger than just cards, because mobile phones account for a large and growing proportion of contactless transactions. As of November 2019, 19% of all contactless transactions took place on a mobile phone, rising to above a quarter in several countries. This was up from 13% a year previously.

Another important point to make is the diverse nature of the countries that have been most successful in deploying contactless. There is little to unite the 21 countries with the highest levels of contactless penetration.

The list includes:

- Countries with advanced, emerging and developing economies
- Countries located in Europe, North America, South America and Asia
- Countries that, geographically, are both small and large
- Countries that are both densely populated and sparsely populated

However, we would argue that these 21 countries do all share a common characteristic or denominator: they are home to a payments industry (and usually a regulator) that is collectively committed to displacing cash. They have understood the need for action and readiness among issuers, acquirers, and merchants. They have generally been active in articulating the benefits of contactless to all parties. And they have taken a pragmatic approach to risk management.

Countries all around the world have embraced contactless
Example countries

Australia	Belarus	Bulgaria	Canada	Costa Rica	Czech Republic	Georgia
Greece	Hungary	New Zealand	Poland	Romania	Russia	Saudi Arabia
Singapore	Slovakia	Solvenia	Spain	Taiwan	The Netherlands	United Kingdom

[2] Juniper Research, Contactless Payments Deep Dive & Forecasting 2018-2012, June 2018.
[3] VisaNet transations December 2019.

Some snapshots from around the world of contactless

Case Study: Costa Rica: The central bank played a pivitol role in the move to contactless.

Immediate impact, helped by a strong regulatory stance

As a contactless case study, Costa Rica may sound like an unlikely country.

In most Latin American countries, the evolution to contactless is only just getting started. However, Costa Rica is well ahead of its peers. Supported by a central bank mandate and an ambitious project to upgrade the payment system for the country's transportation network, Costa Rica began a concerted effort to migrate to contactless in 2015.

The central bank has played a pivotal role in the story. It made the case that, if interoperable contactless cards were adopted at scale, high levels of cash displacement could be achieved. It also calculated that, by implementing contactless payments for public transport alone, a 30% reduction in the purchase volume of cash could be achieved.

By the end of 2018, the country had converted 72% of its payment cards and 77% of its point-of-sale (POS) terminals to contactless, and contactless transactions accounted for 26% of face-to-face Visa card transactions.

By the end of 2019, the penetration of contactless transactions had almost doubled to reach an impressive 49% of all face-to-face Visa transactions. This meant that Costa Rica edged ahead of Chile (which has a contactless penetration rate of 48%), to rank in the global Top 20 countries with the highest levels of Visa contactless penetration.

Case Study: United Kingdom: Acceptance for the London Olympics and transit were the catalysts for contactless becoming commonplace in just four years.

A slow start, followed by a game-changing transit program

As the first country to embark on a mass-market launch of contactless, things took longer to get moving.

Launched in 2007, there was little traction until 2012, when consumers were encouraged to use contactless at the London 2012 Olympics and on the London transport network. This put pressure on issuers to meet the demand for contactless travel. By 2016, contactless had become common place.

Today, 7-in-10 face-to-face Visa transactions in the UK are contactless. With the average transaction value of contactless debit cards sitting at approximately £8, contactless cards are ideal for everyday spend and small-ticket transactions, which has helped to displace the use of cash.

In fact, as a proportion of UK retail spend, cash dropped from 32% to 16% between 2011 and 2019, and an estimated 3.2 million UK consumers live cashlessly (versus 2.2 million people who are cash-reliant).

Contactless cardholders are also more engaged and have significantly higher spend and transactions per card:

- For credit cardholders, the average spend per active contactless card is 1.6 times higher, and the total transactions per active card is 2.1 times higher.
- For debit and prepaid cardholders, the average spend per active contactless card is 2.1 times higher, and the total transactions per active card is 2.5 times higher.[4]

[4] VisaNet Data February 2017.

Case Study: Canada: Segment-leading merchants and a cardholder verification limit of $100 CAD helped contactless become commonplace in just three years.

A strong start, pushed forward by leading retailers

Contactless was launched in Canada in 2010 and became commonplace just three years later. The strong start was spurred on by several segment-leading merchants adopting contactless, which encouraged wider-scale acceptance, helped along by a cardholder verification methodology (CVM) limit of CAD $100.

Today over 80% of merchant point-of-sale devices, including at grocery stores, pharmacies and gas stations, are contactless enabled.

Contactless continues to accelerate:

- 62% of face-to-face Visa transactions carried out in Canada in 2019 were contactless

Contactless cardholders in Canada are more engaged and have significantly higher spend and transactions per card:

- For credit cardholders, the average spend per active contactless card is 2.8 times higher, and the total transactions per 4.5 times higher
- For debit and prepaid cardholders, the average spend per active contactless card is 3.3 times higher, and the total transactions 5.0 times higher

Additionally, cash displacement coincided with the arrival of contactless, with Canada seeing a third fewer cash transactions in 2015 than in 2008.

Meanwhile, several transit deployments promise to catalyse further growth. In May 2018, for example, Vancouver Transit Authority (Translink) launched contactless travel citywide, Laval followed in February 2019, and Toronto is set to follow in 2020.

Case Study: Russia: The introduction of the Pays, means contactless payments accounts for more than 80% of all Visa face-to-face transactions in Russia.

Rapid migration, with a high proportion of mobile payments

Between 2010 and 2013, Visa worked with many of the county's largest retailers to encourage and enable contactless acceptance. Meanwhile, despite a shortage of certified contactless card manufacturers in the local market, Visa also worked with those issuers representing 90% of payment volumes to commit to contactless.

The first retailer to commit wholeheartedly to contactless was Auchan. In 2013, it enabled PIN-free contactless acceptance for transactions of less than RUR1,000 (approximately US$30 at the time). And, based on the benefits Auchan expected from contactless, many other large retailers soon followed suit.

Amid growing enthusiasm for contactless among retailers, Russia's largest Visa customer, Sberbank invested in an infrastructure upgrade.

Between 2014 and 2015 the bank migrated its entire network of around 1 million point of sale terminals (representing some 50% of the entire market) to contactless. Meanwhile, INPAS, a key vendor of acceptance devices, phased out the supply of non-contactless terminals.

In 2016 Sberbank, decided to complement its successful contactless card programmes with the introduction of Apple Pay. And, by 2019, the majority of Russian Visa issuers had introduced Apple Pay and/or Google Pay.

As of the start of 2020:

- 81% of all face-to-face Visa transactions in Russia were contactless
- 22% of all face-to-face transactions in Russia were mobile phone-initiated

Case Study: Australia: Once several segment-leading merchants upgraded their acceptance infrastructure, contactless became commonplace in just four years.

A faltering start, followed by strong retail support

First introduced in 2006, contactless had a relatively slow start.

The technology arrived just as the country's most influential merchants had invested in EMV terminals. Consequentially the merchants had to choose whether to upgrade their terminals and write-off the additional investment, or delay implementation.

Ultimately, in 2009, several segment-leading merchants, including Woolworths and Coles (the two largest supermarkets), decided to upgrade, having calculated that the likely value of contactless acceptance outweighed the undepreciated value of their EMV terminals. This meant it only took four years for contactless to become commonplace, as big businesses accepting contactless drove acceptance downstream to small businesses.

Data from the Reserve Bank of Australia shows that, by 2019, the number of ATM withdrawals was 35% below its 2008 peak, and had fallen by an average of around 5% per year over the previous five years.[5]

Today, almost all face-to-face transactions in Australia are contactless (96% by the end of 2019). Meanwhile, contactless-active cardholders are more engaged and have significantly higher spend and transactions per card:

- For credit cardholders, the average spend per active contactless card is 3.4 times higher, the total transactions 6.1 times higher
- For debit and prepaid cardholders, the average spend per active contactless card is 2.4 times higher, and the total transactions 5.0 times higher

[5] Reserve Bank of Australia, New Payments Insights from the Updated Retail Payment Statistics Collection, March 2019.

Case Study: Georgia: Banks and Merchants have embraced contactless. Today almost 100% of all face-to-face Visa transactions are contactless.

Leading the world in contactless penetration

Visa has been actively working with its customers and partners to improve the checkout experience for consumers by introducing the speed, convenience and security of contactless payments. Consumers in Georgia have quickly embraced the benefits of tapping to pay with contactless cards and digital wallets, with more than nine out of every 10 face-to-face domestic payment transactions using the technology.

Georgia has always been a pioneer in adopting new payment solutions, right from being the first country in Visa's CISSEE sub-region (Commonwealth of Independent States and South Eastern Europe) to conduct a contactless transaction in a drugstore back in 2009 and, a decade later, with the recent launch of Apple Pay.

Key milestones in Georgia's contactless payment journey include:

- 2009 - Liberty Bank conducted the first Visa Contactless transaction in the CISSEE region
- 2013 - Bank of Georgia launched contactless acceptance at McDonald's restaurants across the country
- 2013 - TBC Bank initiated a large-scale deployment of contactless point of sale terminals, and issued a series of iconic Visa contactless card designs and stickers. The banks subsequently cemented these achievements by introducing the first Visa Contactless mobile point of sale (mPOS) solution
- 2015 - VTB Bank Georgia launched host card emulation (HCE) technology, to enable the first mobile payment services
- 2016 - Bank of Georgia Visa launched Visa Token Services, to accelerate disruptive innovation in eCommerce and mobile payments
- 2019 - Georgia became the first country in the Caucasus to launch Apple Pay

By the start of 2020, some 96% of Visa transactions were contactless.

Case Study: Saudi Arabia: The positive impact of a government mandate and marketing awareness campaigns.

Contactless transactions in Saudi Arabia grew very rapidly in 2019. According to figures disclosed by the Governor of the Saudi Arabia Monetary Authority (SAMA), transactions with contactless technology represented 56.1% of all transactions made in 2019, with an annual growth rate of 1,431%. The number of transactions executed via smart mobile devices at point-of-sale (POS) represented 10% of the total value of the transactions executed with contactless.

This success story of acceleration is the outcome of collaboration between various key players, especially Visa and the Saudi Arabia Monetary Authority (SAMA) together with its payment operator Saudi Payments.

The following initiatives have contributed to this success story:

1. Government mandates to increase acceptance

   In late 2015, SAMA issued a mandate to increase the number of terminals from roughly 100,000 to 250,000 units by the end of 2016 targeting the following merchant segments: Quick service resaturants (QSR), fuel and grocery. In addition, the Ministry of Commerce mandated that all fuel stations must accept payment cards, while subsequently expanding this to other retail segments.

2. Visa EDCR Contactless Mandate

   Effective from April 2019, Visa set out a mandate for all POS terminals and new cards in CEMEA markets to be contactless. This mandate was branded "Enabling Digital Commerce Roadmap."

3. Launch of Mada Pay Wallet

   With the launch of Mada Pay Wallet in 2018 on Android phones, based on Visa Tokenization Service, all issuers sped up their contactless certification in order to meet the launch target.[6]

4. Merchant Training and Cardholder Education campaigns:

   The Mada Pay launch led to a series of merchant training workshops and awareness campaigns, which helped increase the number of contactless transactions.

5. Launch of Apple Pay:

   With the launch of Apple Pay in early 2019, KSA issuers provided a mobile payment solution for all iOS users based on Visa Tokenization Service, which further supported the market usage of contactless on mobile and cards as well.

[6] Mada is the local scheme. Mada Pay is an Android-based mobile application that enables cardholders to make fast, easy and secure contactless mobile payments at NFC-enabled merchants throughout Saudi and abroad with Saudi-issued Visa cards (credit and prepaid). Visa and Mada co-badged debit cards can also be on-boarded in the Mada wallet and used with Mada Pay.

Contactless benefits all of the players in the payments ecosystem

Consumers	Merchants	Issuers	Acquirers	Government
A fast, seamless and secure payment experience, that's perceptibly better than paying by cash	Faster throughput at the checkout	Improves card-related economics via increased transaction values and volumes	Opens-up new merchant segments (such as transit)	Helps to displace cash (avoiding its innate costs and risks)
Highly convenient – widely accepted and works at home and abroad	Delivers a better experience to customers	Enables increased customer engagement and greater stickiness	Improves economics via increased transaction values and volume	Reduces the scope for grey economies
Avoids the need to carry cash, or find the right change	Brings a stronger business rationale to investments in chip terminals	An opportunity for competitive differentiation	An opportunity to make real headway in 'cash heavy' merchant sectors	Increases consumer and merchant protection (compared to cash use)
Especially good for transit – no need to go out of the way to purchase a ticket or understand confusing fare rates	Reduced cash handling brings more operational efficiency	Paves the way for mobile payments and wearables	An opportunity to forge a more strategic relationship with key merchants	Helps to increase financial inclusion (by giving more people more reason to have a bank account)
	Less risk of mistakes during the checkout (e.g. giving out too much change)	Reduced cash handling brings more operational efficiency		

Contactless benefits every party

As an indication of the impact of contactless, consider that in Europe contactless-active Visa cardholders used the technology for an average of 18% more transactions in up to 40% more merchant categories than contactless-inactive cardholders – and 85% said that they would recommend the technology to friends and family.[7]

Meanwhile, in Asia Pacific, contactless-active Visa cardholders made 75% more credit card transactions and 101% more debit card transactions than contactless-inactive cardholders.

And, in many of the countries where contactless has been most successful, the introduction of the technology has coincided with a marked decrease in the use of cash. In the UK, for example, as a proportion of UK retail spend, the use of cash halved (dropping from 32% to 16%) between 2011 and 2019.

[7] First Data beyond the transaction, Benefits of Accepting Contactless Payments 2011, https://www.firstdata.com/downloads/thought-leadership/contactless-payments-benefits.pdf.

Five merchant sectors that drive adoption

When contactless was first launched in the mid-2000s, it was assumed that neighbourhood convenience stores would be the most important merchant sector.

Experience has shown that larger chains have a far bigger impact in driving adoption. And, as well as being a significant sector in its own right, transit has an important role to play in catalyzing and normalizing the everyday use of contactless.

Meanwhile, research shows that consumers are eager for contactless, and are more likely to favor those merchants that accept it. In the UK, for example, 84% of people agree it's faster than cash, eight-in-ten say they use less cash, and one-in-five say they become annoyed when they are not able to use it.[8]

Sector	Metric	Benefits of acceptance
Transit	5.5% of contactless transactions	Increases operational efficiency, improves the traveller experience, and enables the operator to shift its focus from ticketing management to revenue collection.
Quick Service Restaurants (fast food restaurants)	10% of contactless transactions	Speed of throughput is a prime driver of revenue and profitability, especially at busy times, and contactless helps to minimize line-ups.
Grocery	34% of contactless transactions	Brings quicker service times, often increases transaction values, and relieves costs and inefficiencies relating to cash handling and coin availability.
Pharmacy	41% of contactless transactions	Brings quicker service times, often increases transaction values, and relieves costs and inefficiencies relating to cash handling and coin availability.
Fuel (service stations)	46% of contactless transactions	Enables an easy and secure pay-at-pump facility, which increases competitive advantage for early adopters, and also increases operational efficiencies

[8] Barclaycard research and TSYS consumer payments study, 2016.

Spotlight on transit

In many countries globally, transit has been the hero merchant for contactless – generating a large proportion of transactions, and helping to catalyse the uptake of the technology more generally.

For consumers, it brings a mix of benefits, by reducing line-ups , eliminating the need to go out of the way to purchase a ticket, and helping visitors to ride with ease. And, for transit operators, it brings significant operational efficiencies, enabling them to focus on revenue collection rather than ticketing.

Also, transit can have a marked halo effect. In the UK, for example, cardholders who started using their card for transit began to use their cards more widely – with the number of transactions on their card increasing by more than 20% on average.

Highlights include:

London

Contactless was introduced for buses in 2012 and across the tube network in 2014. By 2018, it was being used more frequently than the legacy Oyster card system, with more than 874 million journeys. For 2019 it was believed to have surpassed 1 billion journeys, and is expected to surpass 1.5 billion journeys annually by 2025.

New York

Contactless came to the New York Metro system in May 2019. Within just three days, there had been 18,000 taps, smashing the target of 7,000 taps in the first week. The millionth tap was reached just 69 days after the launch and, by the third month, there were around 22,000 taps per weekday.

Vancouver

The city's transit authority launched city-wide contactless travel in May 2018. Within four months, there had been more than 1 million contactless transactions, and the technology was being used for more than 80% of all journeys.

Riyadh

The Riyadh Metro has started to go contactless, with a commitment to install up to 1,200 contactless terminals over three years – the first phase commencing in 2020.

Rome

Rome Metro launched open-loop contactless acceptance in September 2019, with 3,000 contactless transactions made in the first three days. ATAC, the city's transit operator expected this to rise to 50,000 transactions in the first month. Rome was Italy's third transit operator to go live with open-loop after Milan and Florence and planned deployments include Bologna, Venice and Naples.

Johannesburg

Visa launched Africa's first contactless transit system in Johannesburg in the first quarter of 2020, in addition to launches in Ho Chi Minh City as well as Taiwan, Sweden, and Ukraine.

In total, Visa's global transit partner program includes 100 partners worldwide, providing access to transit agencies to an expanded network of technology solutions and expertise. As of the start of 2020, live transit projects were seeing positive adoption with a 40% year-over-year rise in contactless transit transactions. In 2019 alone, Visa helped launch 60 contactless transit projects, including in Edinburgh, Manchester, Miami, New York, Rio, Singapore and, by the end of the year, the organisation was engaged on nearly 180 projects globally.

How Visa is preparing the ground

Clearly, Visa is a strong advocate of contactless

The technology has contributed to a step-change in the way and the frequency with which cards are used. It has also enabled Visa clients and partners (issuers, acquirers and merchants) to become more engaged with their respective customers and it has paved the way for payments initiated by mobile devices and wearables.

The organization has therefore been active in encouraging and enabling clients and partners to introduce contactless, including:

Setting out a roadmap

Visa has mandated a roadmap for the introduction of EMV and contactless for all of its clients in the CEMEA region. Key components include:

- **Issuers and Issuer Processors**
  - All host systems must support EMV contact and contactless from April 2019
  - All newly issued and replacement Visa cards must be both EMV contact and contactless from April 2019
- **Acquirers and Acquirer Processors**
  - All host systems must support both EMV contact and contactless from April 2019
- **Acquirer point-of-sale (POS) terminals**
  - All existing contactless-capable acceptance devices (excluding ATMs) must be contactless-enabled from April 2019
  - All new and replacement acceptance devices (excluding ATMs) must be contactless-enabled from April 2019
  - All acceptance devices (excluding ATMs) must be contactless enabled by April 2023

Note that any country-specific laws and requirements take primacy and supersede Visa Rules.

Advocating best practice

Visa is providing advice and guidance to all clients, recommending that they follow best practices in terms of consumer engagement and communications, and also merchant engagement and communications.

Also, based on the lessons learnt from global implementations, Visa is providing advice and guidance on how contactless programs are set-up and configured. This includes best practices for inherent risk controls – such as using online authorizations for all transactions, making appropriate use of contactless usage controls, and deploying appropriate cardholder verification method (CVM) options.

Importantly, Visa advocates that the CVM-limit is set at the terminal level (rather than at the card level), to ensure a consistent experience for all cardholders and to mitigate risks of fraud. This means that, for any transactions above a given national threshold, the cardholder is requested to enter their PIN in addition to tapping their card.

Engaging with industry forums and stakeholders including governments

Experience shows that contactless launches are at their most successful when several issuers, acquirers and other stakeholder act in concert. This way, critical mass can be achieved more quickly, and communications can be more effective.

To this end, Visa is always keen to engage with key stakeholders, industry forums, and representative bodies (such as central banks, national governance bodies, dedicated steering groups and so on).

Advocating and incorporating complementary technologies

Future growth of contactless will most likely be driven by additional form factors (such as mobile phones and wearables), as well as additional cardholder verification methodologies (such as biometrics, like fingerprints and facial recognition).

To facilitate these innovations, Visa has been working to incorporate complementary technologies into its rules and requirements, such as tokenization and Consumer Device Cardholder Verification Methods (CDCVM).

How stakeholders should prepare the ground

Deploying contactless at scale can be a significant undertaking. For a deployment to be successful, several factors deserve consideration. Regulators can play a vital role in accelerating market uptake by actively engaging in the development of a country's roadmap.

Factors include:

Point-of-Sale (POS) readiness

POS readiness is a critical success factor. The prime consideration is the number and proportion of devices that are contactless-enabled. Other important factors include the age of the existing POS terminal estate (which determines likely replacement and upgrade cycles), the ergonomics of the devices (are they facing the customer, and easy-to-reach), and the level and visibility of POS signage (to indicate to cardholders that contactless payments are both accepted and welcome).

Acquirer readiness

Acquirer readiness extends well beyond the technical capability of being able to process contactless transactions. Considerations include the availability of a range of acceptance devices (to meet the needs of different merchant environments), the level and quality of contacts within target merchants and merchant segments (in that the acquirer is likely to be addressing merchants that have not traditionally accepted cards), and the ability to work with merchants to help them establish a business case for accepting and the availability and quality of merchant education materials.

Issuer readiness

Similarly, issuer readiness extends beyond the technical capability of being able to issue contactless cards and process contactless transactions. Considerations also include their ability to engage with and educate their cardholders about the benefits of contactless and to address any concerns they may have.

Card issuance and reissuance strategies and timescales

The number and proportion of contactless cards in the market is, of course, another key success factor. Often, issuers prefer to follow natural reissuance cycles (where cards are only replaced when they reach their expiry dates). However, there can also be a strong rationale for some forced reissuance, in order for certain cardholder segments to be prioritized. This can include frequent international travellers (who are likely to encounter contactless when travelling abroad), those who have a high propensity to use their card for everyday spend, and those in metropolitan areas with a high penetration of contactless acceptance – and especially when contactless transit is available.

Transit environment

In many past deployments, the ability to pay for transit with contactless has been an important catalyst. An important consideration, therefore, is the scale, structure and attitude of transit authorities and operators. In Costa Rica for example, the central bank calculated that by implementing contactless payments for public transport alone, a 30% reduction in the purchase volume of cash could be achieved, and decided that the implementation of contactless should be orchestrated around transit.

Retail environment

Experience shows the impact and benefits of enthusing and enlisting large flagship retailers. In Australia for example, the contactless roll-out was catalyzed when the country's two largest and most influential supermarket chains decided to accept and promote contactless. An important consideration, therefore is the scale and structure of the retail community. If a large national chain is ready to invest in and advocate the technology, it can be an important catalyst. Particular attention should be given to those merchants in the everyday spend category (such as fast food, grocery and pharmacy), with a high frequency of everyday payments.

Mobile penetration

Contactless is about more than just cards. The technology also works with smartphones and wearables and, in some countries, a high proportion of Visa contactless transactions are generated by mobile phones (in Russia, for example, more than 25% of Visa contactless transactions are from smartphones). In considering the prospects for contactless, consideration should also be given to the penetration of mobile phones, the structure of the mobile telecoms ecosystem and the attitude of the major players – as they can be enlisted as important stakeholders.

Branding considerations

Contactless deployments tend to be most effective when stakeholders act simultaneously and rally around a common message. Important components of any deployments include the contactless indicator (that should appear on every contactless-enabled payment card) and the contactless symbol (that should be used extensively and prominently on and around POS acceptance points). Such details should not be overlooked, nor should their influence be underestimated. For example, Visa analysis has shown that, on average, prominent contactless signage will drive around 2.5-times more transactions.[9]

Risk management considerations

In some countries, government and regulatory stakeholders remain concerned about the security of contactless, and the liability for consumers if their cards are lost or stolen. In fact, contactless transactions are just as secure as conventional EMV chip transactions (some commentators argue that they are more secure). Also, there are several risk controls (such as online-only authorization and appropriate CVM limits) to be deployed. Experience suggests that CVM limits are best set at the POS terminal-level and that they are not set so low that they disincentivize transactions.

[9] VisaNet data, June 2019, VisaNet & Ipsos Secret Shopper Analysis. The tap to pay penetration data is an average of over eight merchant locations surveyed throughout both the Grocery and QSR segments.

Education is key to driving consumer and merchant adoption

In the world of payments, there are many different stakeholders, gatekeepers and decision-makers, including regulators, payment systems like Visa, issuers, acquirers, vendors, processors, and payment service providers.

The consumer is the final decision maker:

- The penultimate decision-maker (the merchant) – decides what payment choices will be offered and which will be favored.
- However the ultimate decision-maker (the consumer) – decides which of the payment solutions offered, they will actually use.

For this reason, in any contactless deployment, engagement strategies and communications programs for these audiences are perhaps the most critical considerations of all. Education, education, education, should not be underestimated.

Experience suggests the following approaches:

Engaging with merchants

- Early engagement with merchants is critically important
- Additional sales is often the most powerful lever when analyzing the business case
- Retailers are much more likely to adopt contactless if this is combined with a scheduled POS upgrade programme
- Implementing with large retail brands is more important than issuing large volumes of enabled terminals

- Understand the merchant's business drivers and help them to formulate a relevant, business case
- Understand their IT lines and work with their ongoing programs to upgrade POS hardware and software
- Provide advice on the type of POS configurations that have worked well
- Make full use of POS branding opportunities
- Help with staff training/education
- Demonstrate that cardholders value contactless acceptance and will change their bahavior accordingly
- Treat retailers as strategic business partners

Engaging with cardholders

- Cardholders are receptive to the benefits but need reassurance about the solution
- Not knowing where to use contactless is a big reason for not using it
- Uncertainty about security can have a negative impact on activation and usage
- Control is a key consideration for the more cautious cardholders

- Communicate, communicate, communicate
- Direct cardholders to where contactless is accepted and incentivize take-up (e.g. through merchant offers and promotions)
- Demonstrate that contactless is extremely secure – and much more secure than cash
- Make sure they feel in control (e.g. clear statements, SMS alerts)

The regulator as a stakeholder

Authorities and regulators can play a key role in fostering a more rapid adoption of contactless by providing the right incentives and mandates in the marketplace. In practice, this intervention has varied from country to country, but one can identify some common patterns and best practices.

Examples include:

1. Recognizing the importance of EMVCo standards for security and innovation

EMVCo is the main international standard-setting body for the payments industry, enabling innovation and ubiquity by maximizing global interoperability and acceptance.

Although most international networks already operate under these standards, the level of adoption varies depending on readiness of infrastructure in each country. Regulators can therefore promote faster implementation by supporting them through local regulation or simply providing active guidance to the industry. In fact, concerns over security and consumer protection have led many regulators around the globe to establish mandates to conclude migration from magnetic stripe to EMV chip-based technology for cards, ATM and POS.[10]

Costa Rican Central Bank Regulation (refer to Case Study on page 10)

In introducing contactless, Costa Rica has considerably out-performed its peers. Due to the key role that the central bank played, Costa Rica has quickly grown to become one of the world's top 20 contactless countries.

To frame its approach, the Banco Central de Costa Rica (BCCR) conducted a study to understand the prevalence of cash in Costa Rica and its impact on the economy. This study found that, in 2017, while cash represented only 10% of transaction volume in Costa Rica, it represented 79% of the total number of transactions. The study also revealed that the total cost of processing cash equates to US$500 million per year (equivalent to 1% of GDP).

Consequently, a working group was established with BCCR and the banking community to agree on a cash reduction strategy. The BCCR also found that 30% of all cash transactions are for the purpose of paying for public transportation, particularly for riding the country's 400+ bus lines. Therefore, to reduce the use of cash, it would be essential to enable electronic payment for public transit fares. Through the working group, it was agreed that an open-loop contactless system would be the best way forward and, to catalyze the process, a new payments regulation came into effect.

This stipulated the following requirements:

Requirement	Deadline
There should be signage at contactless-enabled POS terminals indicating that contactless payments are accepted	14/05/18
Elimination of the requirement for customer authentication for purchases of less than 15,000 colones (US$26)	14/05/18
All credit, debit and prepaid cards in circulation must have both EMV and contactless technology	31/12/18
100% of POS terminals must accept both EMV and contactless payments and authenticate customers via online PIN or biometrics (for amounts greater than 15,000 colones)	01/01/21
All POS terminals must be located within reach of the customer, eliminating the need to surrender the payment method to the cashier at the time of payment	01/01/21

By the end of 2018, the country had converted 72% of its payment cards and 77% of its point-of-sale (POS) terminals to contactless, and contactless transactions accounted for 26% of face-to-face card transactions.

By the end of 2019, the penetration of contactless transactions had almost doubled to reach an impressive 49% of all face-to-face Visa transactions. This meant that Costa Rica edged ahead of Chile (which has a contactless penetration rate of 48%), to rank in the global Top 20 countries with the highest levels of Visa contactless penetration.

[10] In Latin America and the Caribbean alone, nine countries established regulation in favor of chip migration between 2007 and 2016 (Bolivia, Colombia, Costa Rica, Dominican Republic, Ecuador, Mexico, Panama, Peru and Venezuela). More recently, in Pakistan the migration to EMV concluded in December 2019 was the result of a regulation established by the central bank in 2016 (For details see http://www.sbp.org.pk/press/2020/Pr-ATM-02-Jan-20.pdf).

2. Setting card verification methods at a terminal level ensures a consistent customer experience

Contactless transactions provide a convenient and secure way to pay, as long as there is a consistent protocol to require cardholder verification at the point of sale and there is no need to provide a second factor of authentication (such as PIN, signature, or biometrics).

Although international networks like Visa have established thresholds, we do see the need for a broader brand-agnostic, industry-wide understanding that requires validation from policy-makers and regulators. This is particularly relevant in markets where the use of a second factor of authentication in addition to chip has been considered or mandated.

Regulatory measures on authentication

Regulators in several countries and regions around the world have stepped in to support the pragmatic use of cardholder verification – in a way that offers sufficient protection to consumers and retailers but does not act as a barrier to the uptake of contactless.

European Union

The European Payment Services Directive passed in 2015 (commonly known as PSD2) includes a Strong Customer Authentication (SCA) regulation that came into force on September 14, 2019. While the regulation requires two factor authentication,[11] there are some exemptions for contactless, and SCA is not required for contactless payments at point of sale subject to the following conditions:

- The value of the transaction must not exceed €50; and either
- The cumulative monetary amount of consecutive contactless transactions without application of SCA must not exceed €150 (or the local currency equivalent for non-Euro Zone markets); or
- The number of consecutive contactless transactions since the last application of SCA must not exceed five.

Additionally, if the payer initiates an electronic payment at an unattended payment terminal for the purpose of paying a transport fare or a parking fee, SCA regulatory technical standards state that payment service providers (PSPs) are not required to abide by SCA, subject to compliance with the general authentication requirements laid down in Article 2.[12]

Saudi Arabia

In February 2019, as part of the Kingdom's Vision 2030 to become a less cash-dependent society, the Saudi Arabian Monetary Authority (SAMA) released the following operating guidance for contactless:

- No PIN needed for transactions up to 100 Saudi Riyal (SAR), when single transactions between up to SAR 100 accumulate to a total of SAR 300, the cardholder will be required to enter their PIN at the POS. Any contactless transaction amount over SAR100 will require the cardholder to enter their PIN.

Source: SAMA, Operating and Commercial Rules, February 2019

United Arab Emirates

In May 2019, the Central Bank of the United Arab Emirates (CBUAE) released a Card Security Roadmap that incorporates industry feedback on how to move to contactless more rapidly and consistently. Specifically, the CBUAE stipulated the following mandates:

Requirement	Deadline
New and replacement cards need to be contactless enabled.	07/07/19
New and replacement terminals need to be contactless enabled (not including ATM terminals).	31/12/21
Contactless transactions are capped at AED300, beyond which the cardholder will need to authenticate the transaction.	31/12/19
Contactless transactions below AED300 will need verification on the fourth consecutive transaction, regardless of the elapsed time between the first and the fourth contactless transaction or merchant location.	31/12/19

Source: Central Bank of the United Arab Emirates, Circular 2094, May 2019

[11] For example, in a Chip and PIN world - possession of the card is one factor and the PIN number is a second factor. Factors must be independent such that if one factor is compromised the reliability of the other factor is not compromised. For cards, present one factor is always possession evidenced by the cryptogram.

[12] Article 2 states that payment service providers shall have transaction monitoring mechanism in place to detect unauthorised or fraudulent payments that take into account a defined set of minimum risk-based factors.

3. Fostering open loop contactless transactions in mass transit

As mentioned throughout this paper, EMV-based contactless technology is particularly useful in segments like public transportation, where a fast, reliable and secure way to pay is crucial, while also offering a very visible and habit-forming opportunity for promoting financial inclusion and cashless payments.

Introducing contactless for transit payments expands acceptance and contributes to consumer adoption, while transit payments, often daily, can help consumers become acquainted with and see the benefit in using electronic payments.

Electronic payments can also have a positive operational impact on transit, since they can facilitate the integration between different modes of transport (via integrated ticketing and payment) and even allow system operators to obtain insights into their customer base that would otherwise be difficult in a predominantly cash-based system.

Frequently the possibility to incorporate this technology depends not only on the willingness of a transit operator to adopt it, but also on the guidance and vision that national or sub-national transportation can provide to the rest of the industry. This can entail a broad array of policy and administrative actions, including the very basic need of incorporating EMV contactless technology in transportation licenses, bids and request for proposals in mass transit projects.

4. Policies and regulations to support acceptance

Contactless provides a unique opportunity for governments to increase the penetration of digital payments in an economy if the technology is properly leveraged with additional policies and mandates. The experience around the globe includes tax incentives granted to consumers and merchants for using digital payments, establishing specific acceptance mandates and developing issuer-funded acceptance development funds.

Acceptance initiatives from around the world

Government-led initiatives from several countries around the world offer interesting insights on how a country can move faster to digital payments when combining contactless technology and enabling public policies.

Saudi Arabia, acceptance mandates

In November 2019, in close collaboration with other ministries, the Saudi Arabian Monetary Authority SAMA, supported by educational campaigns, announced the implementation of mandatory acceptance of contactless payments for car workshops and related cash-centric merchant segments. In parallel, SAMA announced that the growth target for non-cash transactions in the year was widely exceeded, reaching 36% of total transactions and well in line with the Kingdom's Vision 2030 target of reaching 70% cashless transactions in the economy.[13]

Russia, acceptance mandates supported by educational campaigns

In 2018 the Russian Central Bank reported that the share of cashless operations in the country had steadily grown over the previous few years, jumping from 47.6% to 55.6% of total "turnover of retail trade, public catering and paid services" while contactless transactions had expanded more than four-fold.[14] An important contributory factor was a specific provision in the Consumer Protection Law that requires all sellers of goods and services with annual sales in excess of 40 million Ruble (around US$650,0000) to accept digital payments.

Malaysia, acceptance development fund

In Malaysia, the number of POS terminals increased from 278,266 in 2015 to 620,855 in 2019. This was driven in large part by a Central Bank measure to create a fund by which issuers reinvest a proportion of their credit card interchange revenues in the deployment of contactless-enabled point of sale terminals.

Although credit cards remain the most widely used payment card in the country, the share of debit card transactions as a proportion of total payment card transaction volume increased from 28.3% in 2017 to 35.2% in 2018. More significantly, the incorporation of mandated contactless debit issuance along with the growth of contactless-enabled POS infrastructure led to a 287.4% increase in the usage of contactless debit cards (transactions jumped from 12.8 million in 2017 to 49.7 million in 2018).[15]

[13] Source: SAMA press releases available at http://www.sama.gov.sa/en-US/News/Pages/news26112019.aspx and http://www.sama.gov.sa/en-US/News/Pages/news020112019.aspx.
[14] Russian Central Bank, 2018 Annual Report, p.60 and p. 343.
[15] Bank Negara, Financial Stability and Payment Systems Report 2018, p. 112.

Conclusion: The Visa perspective

Visa has been a prime mover in the implementation of contactless payments across world. We have worked directly with our clients, the retail community, the vendor community and the regulatory community to identify and implement solutions. We are also able to draw on learnings from contactless deployments across the world.

Based on this experience, we believe the imperatives for any future roll-outs can be summarized as follows:

1. Move as a market

- Ensure that contactless is implemented in a manner that provides a consistent payment experience for both cardholders and retailers
- Getting stakeholders to act simultaneously is generally the best way to achieve critical mass
- Payment businesses wherever possible should work with existing national governance bodies or forums or set-up dedicated steering committees

2. Draw on past learnings

- All parties should learn from previous implementations and apply best practices in:
  - Transit implementations
  - Cardholder Verification Limits
  - Authorization and authentication methodologies
  - POS configurations
  - Merchant and consumer engagement

3. Focus on the things that make the most difference

- Transport is a killer application – and often a very willing partner
- 'Big Retail' can really accelerate adoption – and also has a lot to gain
- Densely populated areas tend to be the most successful
- Those customer segments that are likely to be receptive should be the immediate target

4. Education, education, education

- Cardholders should be made more aware of contactless – and the everyday benefits it brings
- All stakeholders should be reassured over those nagging security doubts
- The industry should help to educate merchant sales staff – so that consumers have a positive POS experience

Overall, it should be emphasized that contactless is living up to its early promise. It delivers tangible business value to merchants. It meets the needs of consumers, and those who use it are strong advocates.

It also helps the payments ecosystem and its stakeholders to:

- Out-compete cash
- Open-up new merchant segments to cashless payments
- Create new value within payment card operations
- Pave the way for more mobile and digital payments

About Visa Consulting & Analytics

Visa Consulting & Analytics is a global team of hundreds of payments consultants, data scientists and economists across six continents.

- Our consultants are experts in strategy, product, portfolio management, risk, digital and more with decades of experience in the payments industry.
- Our data scientists are experts in statistics, advanced analytics and machine learning with exclusive access to insights from VisaNet, the largest payment network in the world.
- Our economists understand economic conditions impacting consumer spending and provide unique and timely insights into global spending trends.

The combination of our deep payments consulting expertise, our economic intelligence and our breadth of data allows us to identify actionable insights and recommendations that drive better business decisions.

We are therefore ideally placed to help governments, banks, merchants and other such stakeholders to plan for an effective implementation of contactless technology – and drawing on our global experience, we have several ready-made service lines available.

For more information, please contact your Visa Account Executive or email Visa Consulting & Analytics at **VCA@Visa.com**. You can visit us at **Visa.com** or on **YouTube**.