



How Issuers Can Deliver Mobile Payments Today: A Guide for Contactless Sticker Issuance

An Issuer White Paper

Discover® New Technologies

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INTRODUCTION

Since the introduction of contactless payments in the earlier part of this decade, the payments industry has made steady progress creating consumer awareness while building the merchant point-of-sale infrastructure necessary to support widespread issuance of contactless payment devices. However, the “boom” in contactless payments has been delayed in large part because the introduction of mobile devices with embedded Near Field Communications (NFC) capabilities has not evolved as quickly as expected. Card issuers and mobile carriers continue to evaluate the best business model for offering this technology to their customers and a stalemate has persisted for the past two to three years. As a result, a new payment technology has taken center stage to ‘bridge the gap’: contactless stickers.

Contactless stickers were introduced as early as 2006 by On Track Innovations (OTI), and early pilots in closed-loop campus environments demonstrated feasibility for larger-scale deployments.

Today, other limited product offerings are in progress, mostly by reloadable prepaid card issuers. However, very little information has been published about how contactless stickers can augment an issuer’s current portfolio and add new revenue to their bottom line.

This white paper is intended to share detailed data on the Discover® Zip® mobile sticker pilot program – conducted with more than 700 Discover employees – and offer careful analysis and best practices for deploying an effective contactless sticker program. Issuers can garner important information to better evaluate the viability of leveraging contactless stickers in their portfolio, which can help attract new cardholders, and deliver a true (and potentially long-term) ‘top of wallet’ position.

What is a Contactless Sticker?

A smart-sticker with an embedded microprocessor chip that enables secure, contactless payments between the sticker and a contactless reader device.



A BRIEF HISTORY

While First Data's release of its GO-Tag™ contactless sticker solution at the Democratic National Convention in mid-2008¹ may be considered the "birth" of the contactless sticker, On Track Innovations (OTI) first introduced contactless stickers at industry events such as CardTech SecurTech and Cartes in 2006. Heartland Payment Systems launched one of the first closed-loop programs in 2007 using OTI's "Smart Stickers" with the campus payments program at Slippery Rock University.² Although the technology has not reached large-scale deployment yet, it has been tested for several years and has proven to be an interesting and viable mobile option.



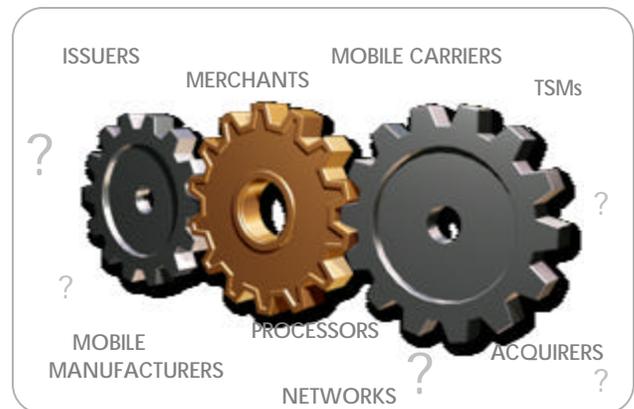
² Heartland Sticker

For more information regarding the 2007 Discover/Motorola NFC pilot, please contact your Discover Relationship Manager.

The Growing Case for Contactless Stickers

Several NFC-enabled phone pilots emerged in 2007 as issuers and payment networks prepared for widespread deployment; however, industry advancement and consumer adoption since then has been slow-moving. Although there is no end to differing opinions on the why NFC hasn't moved faster in the U.S., there is an overarching theme upon which most agree: key stakeholders are still struggling to find a business model where all parties in the value chain can obtain the appropriate amount of return for the services that they provide.

The mobile payments ecosystem is further complicated by the introduction of more constituents into the system, including mobile carriers, mobile handset manufacturers, trusted service managers (TSMs)³, and others. While mobile NFC offers additional value and convenience for consumers and revenue generating opportunity for providers, it is yet to be determined how much additional revenue must be generated to share with these new players. By the best estimates, this debate is likely to continue for some time – and even when a mutually beneficial business model is discovered – it will likely take another 12 to 24 months for NFC handsets to reach the market in significant volumes.



¹ PRNewswire.com, "New Contactless Payment Technology Showcased at Democratic National Convention", August 22, 2008, <http://www.prnewswire.com/mnr/firstdata/34355/>

² CR80 News, "Heartland's new micro-payments division partners with OTI for "cards" and readers", Oct. 31, 2007, <http://www.cr80news.com/2007/10/31/heartlands-new-micro-payments-division-partners-with-oti-for-cards-and-readers>

³ Trusted Service Managers are entities who are trusted by mobile carriers and issuing banks to transmit their encrypted data over-the-air to the mobile handset. TSMs are also responsible for unlocking and locking the secure elements (SEs) on the handset (such as a SIM card or an NFC microchip) and placing data in designated areas of the SE.

In stark contrast to the NFC conundrum, contactless stickers can be deployed immediately since they are not dependent on other technology advancements or business model reconciliation, and they do not require new participants in the value chain. They are also fulfilled in much the same way that magnetic stripe and contactless cards are fulfilled today, offering the opportunity for relatively fast deployment. The stickers are “carried” through standard card personalization and fulfillment equipment on an ISO-sized card,⁴ and mailed to cardholders who can either snap them out of or peel them away from the ISO card. The stickers are activated in exactly the same way as traditional magnetic stripe cards, helping to simplify the consumer education process. Better news yet is that most major card personalization bureaus offer this service today. In short, stickers allow for standard (existing) deployment options, they require minimal consumer education to help foster adoption and usage, and they can provide the ultimate in convenience for consumers who have complete control to determine placement onto personal devices or accessories that are always in hand.

PILOT EXPLORATION: THE DISCOVER TRIAL

In April of 2009, Discover launched a contactless sticker pilot with its employees at its Riverwoods, Illinois (Chicago) and Salt Lake City, Utah facilities. The pilot continues as of the fall 2009 with more than 700 participants. Although this pilot is focused on Discover employees, the stickers are fully enabled for use at any of the over 60,000 merchant locations that currently accept Discover® Zip®, the network’s contactless payments solution. Discover recognizes that consumer opinions may vary as compared to the employee base; however, there are significant technical and operational lessons that will clearly apply to, and benefit, nearly any contactless sticker program.

⁴ ISO – International Organization for Standardization

Discover had several objectives for the Discover[®] Zip[®] pilot:

1. Can end users easily activate and use the stickers?
2. Can end users easily understand how to detach the stickers from their holders and apply them to the personal item of their choosing?
3. What kind of personal items would they attach the stickers to?
4. How well do they actually perform at the point of sale?
5. How do merchants react?
6. Would employees recommend that this product is ready to release in the marketplace?
7. What does Discover need to improve upon before making contactless stickers generally available to customers?

The balance of this paper will explore details on how contactless stickers work, and provide Discover's detailed findings related to the objectives described above. The Appendix provides specific highlights of the Discover[®] Zip[®] program and how issuers can acquire more details on adding it to their portfolio.

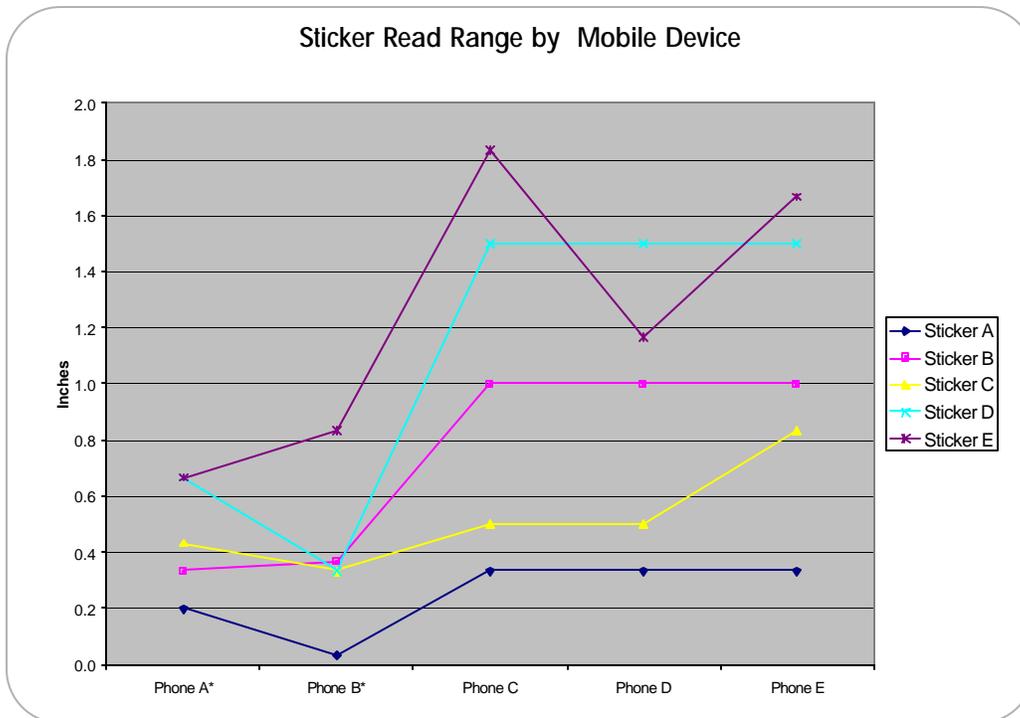
How Contactless Stickers Work

Similar to card and key fob versions, a contactless sticker contains an embedded microchip and antenna. When the sticker and contactless reader are in close proximity, the reader sends power to the microchip by means of the electromagnetic field that the reader generates (note: there is no power source in a contactless sticker, card, or key fob). The two devices communicate using a series of radio frequency transmissions and a secure payment transaction occurs.⁵

There is one significant difference between a sticker and its contactless counterparts: reading distance. Reading distance, also known as read range, is the distance at which a contactless device can be read by the terminal. While cards and fobs readily meet the read range standards set by the payment networks, 4 cm (or about 2 inches), some stickers have difficulty achieving these standards depending on the mobile device that the sticker is attached to and/or the contactless terminal being used. It is important to note that this discrepancy in read range does not mean that the stickers are not ready for consumer use or that they are unreliable, it only means that issuers must take more care to select a sticker that has been tested and approved by its payments network partner to ensure consistent results in a wide variety of environments (see following chart)⁶.

ISSUER TIP # 1

Be sure to select a contactless sticker technology that has been well tested and proven; look for reliability among a variety of application scenarios.



⁵ For more information on Contactless payments, see the Smart Card Alliance whitepapers (<http://www.smartcardalliance.org/pages/activities-councils-contactless-payments-resources>).

⁶ Graph developed by Discover is illustrative of performance differences between various stickers and handsets tested; graph is not intended to represent actual products in market. Phone A and Phone B are representative of handsets with metal casings.

Design Elements that Improve Performance

The mobile sticker is approximately one-quarter the size of a standard card, and the antenna is approximately one-half the size of its card counterpart. The size of the antenna impacts reading distance. Although small antenna key fobs have been on the market for some time, and many perform quite well, the combination of a smaller antenna and placement on a mobile phone (which generates a significant amount of electrical interference) makes communication between the sticker and the contactless reader more challenging. Placing a sticker on a handset with a metal surface versus a plastic surface depletes the read range even further.

ISSUER TIP #2

Reliability in the read range can be dramatically improved if the contactless sticker strikes a delicate balance between surface area, antenna design, size, and specialized internal materials.

This challenge can be overcome by placing a layer of ferrite, a metallic substance, in the sticker to shield the electronic noise generated by the handset from the communications of the payment chip and reader. A larger antenna can also improve communications by increasing the size of the sticker, (i.e. the surface area). Different antenna designs may also make a difference. In general, the larger the antenna and the larger the ferrite shielding, the more likely the sticker will perform at longer read ranges. Stickers with extra large surface areas may not be desirable as they may not be aesthetically attractive to cardholders and may not “fit” on smaller handsets or other mobile devices.

Select Payments Network-Certified Stickers

In launching your contactless sticker program, Discover recommends selecting products that have been payments network certified. Best practices suggest that issuers test stickers from many manufacturers against contactless terminals that are in market today, and in conjunction with many popular cell phone models. An issuer’s payment network should also offer guidance on which stickers will best suit its needs and provide its cardholders with the best experience at the point-of-sale.

ISSUER TIP #3

Be sure to select a contactless sticker device that has been certified by your payments network. Ask your payments network for guidance on product selection to meet the unique needs of your portfolio, and how you can help deliver the best consumer experience at the point-of-sale.

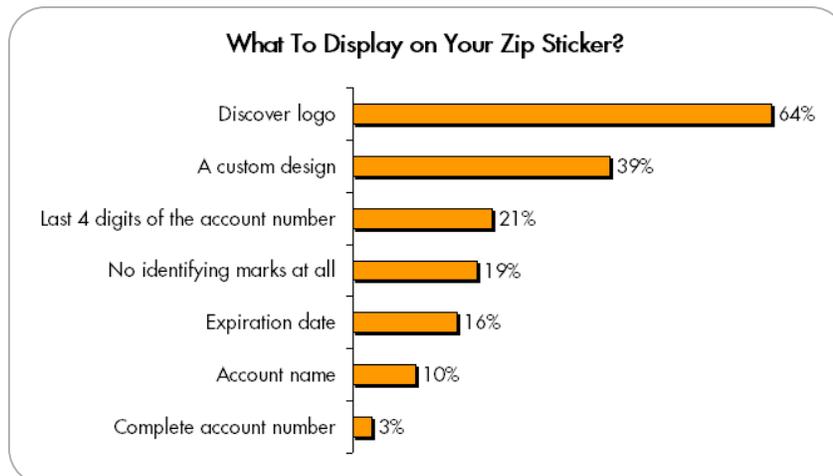
Sticker Artwork Choices

Clearly, the contactless sticker has a much smaller surface area than a conventional bank card. And unlike the card, the back of the sticker is no longer available for printing. These characteristics mean that items typically present on a conventional bank card such as magnetic stripes, signature panels, and embossed letters, are no longer options for stickers.



In October 2009, Discover released manufacturing guides for Discover® Zip® stickers. To ensure the best experience at the point of sale, Discover will require that the Discover® Zip® indicator and the EMVCo⁷ contactless payment device icon be used (see image above). The remaining real estate on the sticker will be at the discretion of the issuer. Because the majority of the plastic that carries the sticker through the fulfillment process will be thrown away by the cardholder, Discover suggests that it is an ideal place to print instructions.

Discover polled pilot participants about what elements they would (and would not) like to have printed on a contactless sticker. The chart below indicates that the majority of cardholders believe the bank's logo is important, and a little more than one-third would prefer to choose the sticker design (artwork) themselves. There was an overwhelming response not to place certain information on the sticker such as account number, expiration date, and cardholder name, since a common location for consumer placement will be a mobile phone or handheld device, thus making the information easily seen by others.



⁷ EMVCo, comprised of American Express, JCB, MasterCard, and Visa "owns contactless symbols that communicate the presence of contactless capabilities in a payment device or reader, which can be licensed to card issuers and reader manufacturers. The contactless symbol helps consumers and merchant staff to easily understand how and where to present contactless cards and other devices so that they interact correctly with the terminal."

(http://www.smartcardalliance.org/resources/pdf/Contactless_Payments_FAQ.pdf).

Fulfillment Options

There are several options for sticker and companion card fulfillment. Many of the sticker and card combinations are outlined in the chart below, along with survey results from the Discover pilot. Discover recommends testing different fulfillment scenarios to see which ones are optimal for an issuer's card portfolio. Also, issuers should inquire about their card fulfillment bureau's ability to deliver each of these combinations and related pricing.

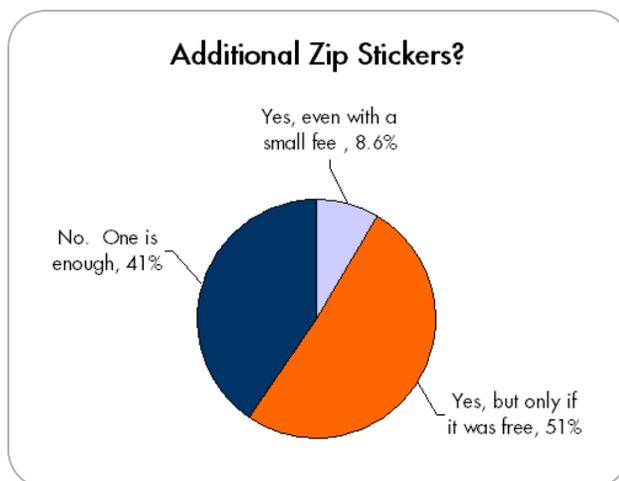
Fulfillment Configuration	% Response
1 sticker with 1 magnetic stripe card companion	59%
2 stickers and no card companion	23%
1 sticker with 1 contactless card companion	20%
1 sticker and no card companion	13%

(NOTE: more than 1 choice was permitted)

Discover also polled pilot participants about whether they would like additional stickers. Nearly one-half of those surveyed would like to receive an additional sticker at no cost. The primary reason for a second sticker at no cost was for placement on a second phone, PDA or MP3 player for added convenience. The second most common reason for desiring another sticker was to provide the same payment device for a spouse or significant other. Note that providing stickers to children was not a popular response, which was an expected outcome since the pilot was a credit product, not a prepaid product test.

ISSUER TIP # 4

Pre-test various fulfillment scenarios to determine which ones are optimal for your specific card portfolio needs.



The Fulfillment Process

The Discover pilot fulfilled one sticker via U.S. mail which was linked to the employee's existing magnetic stripe card account. During the enrollment process, interested employees stated which personal card they wanted the sticker linked to. The card carrier was an 8 ½ x 11 standard letter with tailored instructions on the front and back. The carrier included the following instructions:

- How to activate the device
- How to snap out the sticker away from standard-sized card plastic
- How to affix the device to the item of their choice and best practices for placement
- Participating merchants and how to use the sticker at the point-of-sale



No changes were made to the customer service IVR or computer systems. Customer service representatives were provided with a one-page bulletin and asked to route any issues that they could not resolve to a single Discover subject matter expert (SME). Pilot participants were also provided with a website link via email that contained this information.

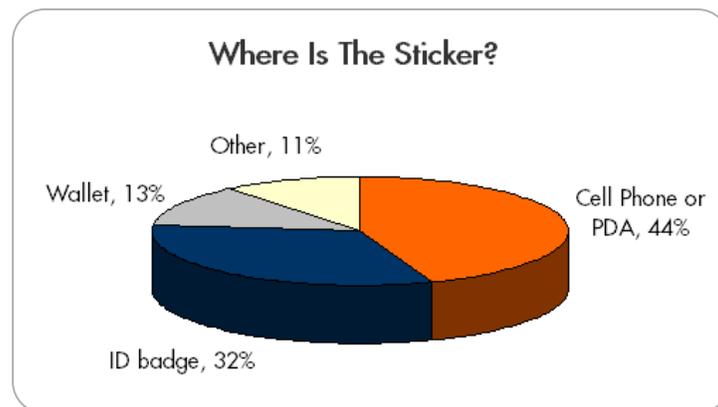
The vast majority (90%) of employees stated that the activation was easy and completed with one call, and 78% found the stickers either easy to use from the first the use, or easy after using them only a few times. 70% were very satisfied with the pilot communications, while 27% were somewhat satisfied. Escalated issues were minimal and readily handled by a single SME.

Discover believes this pilot demonstrates that with proper communications, there can be a very positive customer experience regarding sticker activation and product placement. Although the pilot was conducted with financial services employees, no participants had any prior experience with contactless stickers.

Sticker Placement

One of the things Discover wanted to learn through this pilot was whether customers would actually place the stickers on their phones, or if they would attach them to other personal items. In our enrollment offer, instructions purposely offered vague guidance in describing what items the stickers could be attached to. We quickly learned however that some instruction was required in order to get participants to enroll. Updated instructions were developed as follows: "Place on personal devices such as your mobile phone, PDA, Discover ID badge, or any other personal item that is always at hand." The instructions also stated that this is a payment device that the sticker is tied to your credit card, and should be treated as such.

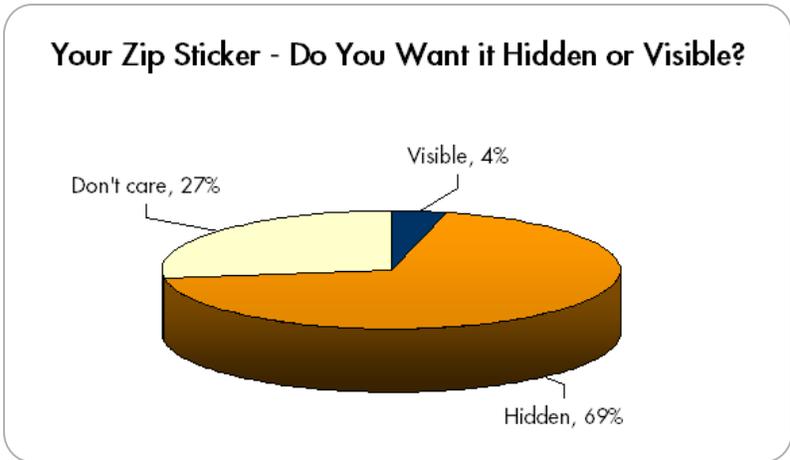
When participants were polled on where they placed the sticker, it was interesting to note that 32% placed it on their company ID badge. Pre-deployment assumptions believed that the vast majority of stickers (80 – 90%) would be placed on phones and PDAs.



The Discover Chicago campus is contactless-enabled. The cafeteria, two convenience stores, and all of the 40+ vending machines have Discover® Zip® readers. Employees quickly determined that placing the sticker on their corporate ID badge meant they could go nearly anywhere on campus and purchase items without their wallet or purse. Although the intent of this pilot was not to test a multi-application contactless device, Discover found that the combination of corporate identification card and payment device was very attractive for employees. Some of the feedback that participants shared as their favorite aspects of using the contactless sticker included:

- "Easy to use and was always convenient"
- "Excellent functionality... no need for my wallet"
- "Ease of use especially when I have my hands full"
- "Convenient, convenient, convenient"
- "I did not have to carry purse or wallet"
- "Not having to dig in my wallet for my card"
- "I could put wherever I wanted it, very convenient"

Another interesting finding was feedback about sticker placement on devices where they could be easily seen. The pilot management team was impressed by the creativity demonstrated by participants in finding various ways of hiding stickers under the phone's protective case ("skin"), under the battery cover, and other unseen yet convenient locations.



Discover believes these results tie very closely to responses provided when participants were asked what information should (and should not) be printed on the sticker. While participants overwhelmingly enjoy the product, they clearly do not want to broadcast that their cell phone is a payment device. Discover suggests that a balance can be struck with subtle branding, by not printing sensitive information such as the account number and cardholder names on the sticker, and by creating mobile device accessories that aid in hiding the sticker without negatively affecting performance.

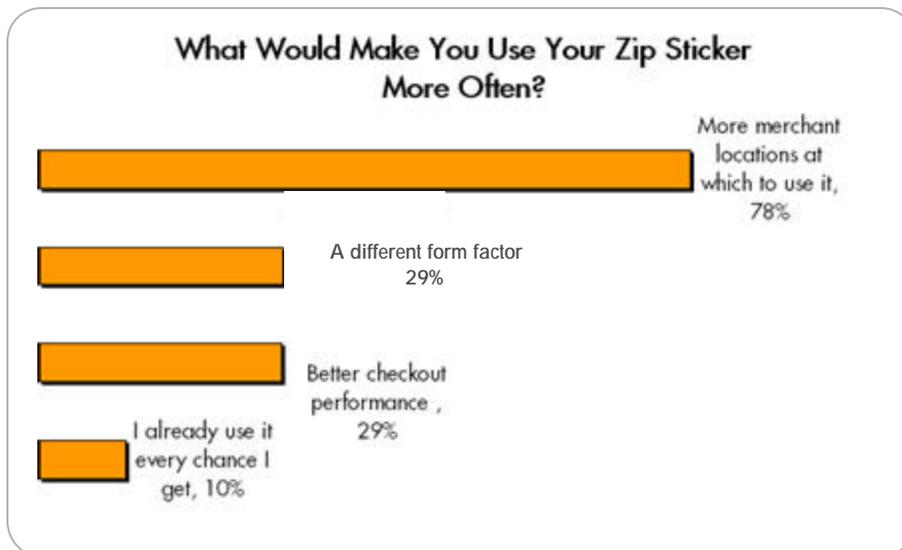
PILOT EVALUATION

As with any new product test, there are always opportunities for improvement. There were two constant themes throughout the survey results.

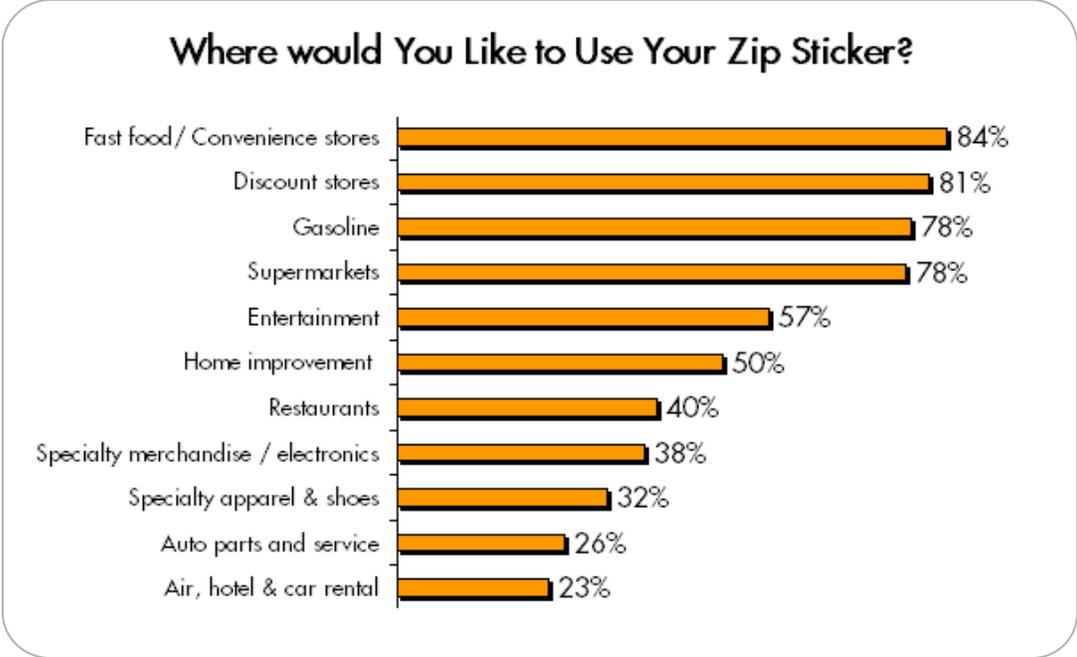
1. "Sometimes I have to tap my sticker several times at the point of sale before it reads."
2. "I want to use my sticker at more merchant locations."

Discover took careful measure of this important feedback and quickly addressed the customer experience issue at the point-of-sale. In order to absorb lessons as quickly as possible, the pilot team used first generation prototypes in the pilot. Understanding that these samples did not have a strong read range, Discover decided to perform the pilot only with employees. Throughout the trial, the team worked with leading card manufacturers on improving the product across a variety of functions. Today, Discover offers a certified product that is proven to perform consistently and reliably at the point-of-sale on a variety of devices and with a variety of readers, and a best practices team that can guide issuers through a successful launch and program management process.

Certainly the number of contactless merchants cannot be addressed as quickly. While Discover® Zip® acceptance has grown to over 60,000 merchant locations since 2006, the pilot demonstrated clearly that once customers experience the convenience of paying with a device that is always at hand, they want to use it everywhere they shop. Discover has an aggressive growth plan for contactless merchant acceptance, with recent deployments at merchants including McDonald's, Rite Aid, 7-Eleven and Home Depot. As more of these contactless devices are in consumers' hands, merchants will be even more motivated to install contactless readers at an accelerated pace.



When asked which merchant categories are best suited for Discover® Zip®, there was interest in virtually every spending category. However, five clear favorites emerged: fast food, convenience stores, discounts stores, gas stations and supermarkets. One-quarter of participants also wanted to use their sticker everywhere they shopped.



CONCLUSION

Discover believes that while NFC mobile commerce will ultimately revolutionize the way payments are made, it will not be widely available for several more years.

In the meantime, the contactless sticker can help build near-term transaction volume and a top-of-wallet position for issuers while advancing consumer awareness of contactless payment options. And while multi-card wallets, reward redemption, and other mobile products that NFC enables are the end-goal, Discover believes that stickers are also an important first step towards mobile commerce, and that first movers will reap rewards for launching them sooner rather than later.

For issuers, contactless stickers may:

- Teach cardholders how to use the contactless reader
- Educate cardholders on the ease and convenience of paying with a mobile phone
- Allow issuers to test multi-purpose payment devices such as:
 - Payment and Building Access (campus cards)
 - Payment and Transit (open loop transit cards)
- Drive the issuer's card to "top-of-wallet" as only one sticker can be used per device
- Differentiate issuers from the competition
- Earn a greater percentage of everyday spend
- Spur merchant deployment of contactless readers

The Discover Philosophy

Our philosophy since the inception of the network has been to take a well-planned, thorough approach to developing and launching new technologies. This process helps ensure the reliability, functionality, and usability of every product, and helps minimize risk to clients while optimizing their go-to-market speed. It also allows Discover to maximize its subject matter expertise in any given area to better support every customer through the engagement process.

For More Information

To learn more about Discover® Zip® and contactless stickers, other Discover product offerings, or about issuing Discover cards, please contact your Discover Network Relationship Manager, visit DiscoverNetwork.com, or call 1-866-847-2344.

APPENDIX

About Discover® Zip®

Launched in 2006, Discover® Zip® is a contactless payments application available in a variety of forms such as standard bank cards, key chain fobs, or its latest form, the Discover® Zip® contactless sticker. These contactless payment devices securely transmit payment information to a special reader at the merchant checkout through a wireless interface. Customers can speed through the checkout line with a simple tap of their favorite payment device, using their every-day spend or other card account.

Discover® Zip® is accepted at over 60,000 U.S. merchants including:

- 7-Eleven
- Best Buy
- Braum's
- Circle K
- Dairy Queen
- Einstein Brothers Bagels
- Jack-in-the-Box
- Kum & Go
- Mac's
- Meijer
- New York & Company
- NYC Taxis
- Office Depot
- The Paradise Shops
- Sbarro
- Sheetz
- Spartan Stores
- Sports Authority
- Tim Horton's
- UTA
- Vending
- Whataburger

In addition, Discover® Zip® is being deployed at the following merchant locations:

- Bartell Drugs
- Chevron
- Compass Group
- Faber, Coe & Gregg
- Hess
- McDonald's
- Taxis (Chicago, Philadelphia, & more)
- ToysRUs
- The Home Depot
- Wendy's

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