THE CHANGING RETAIL PAYMENTS LANDSCAPE

Banking and the Economy

A Forum for Minority Bankers

September 29, 2016

Terri Bradford

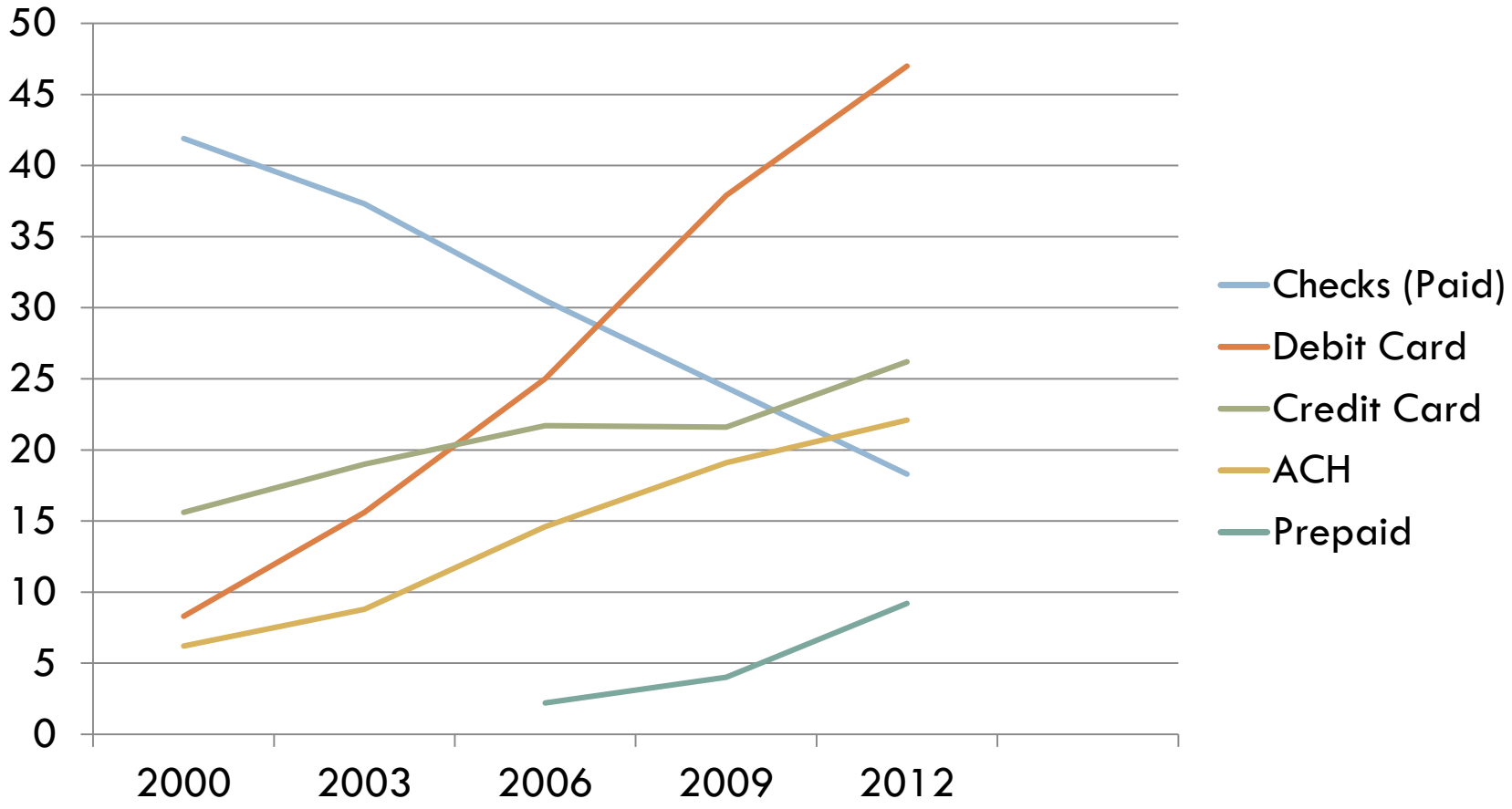
Agenda

- U.S. Retail Payments Landscape
  - Overview of the Federal Reserve 2013 Payments Study
    - Payments Trends – How we are paying "today"
    - Fraud Statistics
- EMV Overview
  - What it is
  - What it does/does not do
- Emerging (Alternative) Payments Landscape
  - How might we pay in the future?
    - Card-for-all-cards
    - Mobile Payments
    - P2P Payments
    - Virtual Currency
- Strategies for Improving the U.S. Payments System
  - Faster Payments Task Force
  - Secure Payments Task Force

2013 Payments Study: Description of Surveys

- **Depository & Financial Institutions Payments Survey (DFIPS)**
  - Checks, ACH, wire, debit and prepaid cards, credit card, cash, online and mobile initiation, unauthorized payments (third-party fraud)
- **Networks, Processors, and Issuers Payments Surveys (NPIPS)**
  - 15 different surveys
  - Cards
  - ACH
  - Alternative payments
- **Check Sample Survey (CSS)**
  - 11 banks
  - Included paid checks and checks deposited
  - Mostly Viewpointe Archive

Trends in noncash payments 2000-2012, by number and type of transaction (billions)



Credit, debit and prepaid card trends include general-purpose and private-label payments.

Number and growth of noncash payments 2000-2012, by number and type of transaction

	2000	2003	2006	2009	2012	CAGR* 2000-12	CAGR* 2009-12
Totals (billions)	**72.4**	**81.4**	**95.2**	**108.1**	**122.4**	**4.5%**	**4.2%**
General-purpose card	**20.6**	**30.8**	**44.3**	**58.4**	**73.9**	**11.2%**	**8.2%**
Credit card	12.3	15.2	19.0	19.5	23.8	5.6%	6.8%
Debit card	8.3	15.6	25.0	37.5	47.0	15.6%	7.7%
Prepaid card**	0.0	0.0	0.3	1.3	3.1		33.9%
Private-label card	**3.8**	**4.6**	**5.8**	**6.1**	**8.5**	**6.9%**	**11.6%**
Credit card	3.3	3.8	2.7	1.5	2.4	-2.6%	17.1%
Prepaid card			1.9	2.7	3.6		10.8%
EBT	0.5	0.8	1.1	2.0	2.5	13.6%	8.1%
ACH	**6.1**	**8.8**	**14.6**	**19.1**	**21.7**	**11.1%**	**4.4%**
Checks (paid)	**41.9**	**37.3**	**30.5**	**24.5**	**18.3**	**-6.6%**	**-9.2%**

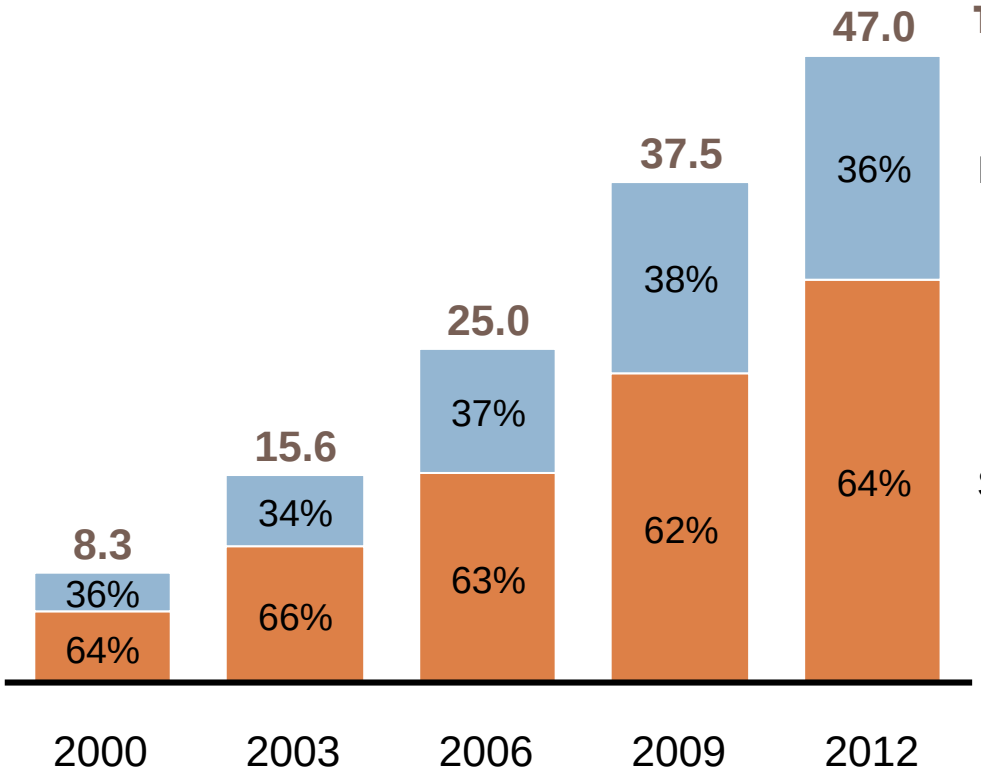
Source: Federal Reserve Payments Study www.frbservices.org/communications/payment_system_research.html

Figures may not add due to rounding.
*Compound Annual Growth Rate
** The number of general-purpose prepaid card transactions in 2000 and 2003 was negligible.

Both PIN and signature transactions grew - More recently, signature grew relatively faster

Number of GP debit card payments 2000-2012, by network type

Billions



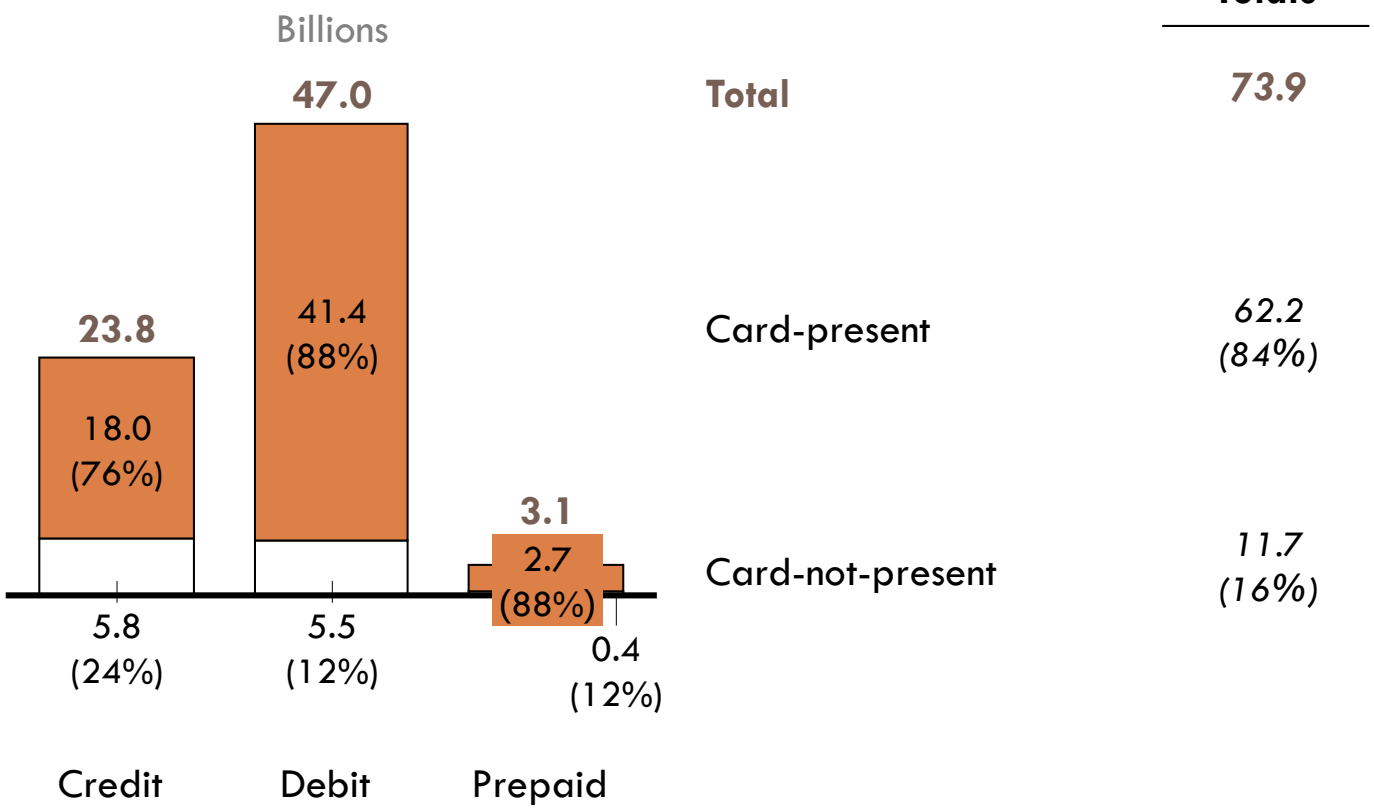
	CAGR 2000-12	CAGR 2009-12
Total	15.6%	7.7%
PIN	15.4%	5.2%
Signature	15.7%	9.3%

CAGR is compound annual growth rate.

SOURCE: 2013 Federal Reserve Payments Study

Debit cards dominated CP payments
Credit cards had more CNP Payments

Number of CP and CNP payments in 2012, by GP card type



Column sizes vary to reveal absolute scale. Card-not-present payments are shown on the bottom, with the number of payments and percentages printed below the axis. Prepaid card-not-present payments are too small to be visible. Figures may not sum because of rounding.

SOURCE: 2013 Federal Reserve Payments Study

2013 Fed Payments Study: Fraud Statistics

Putting Payment Fraud In Context

Fraudulent payments represent about

37 cents per $10,000 of payments transactions.

Check, ACH and
Card Payments
Transaction Value

$174.7 trillion

United States - 2012

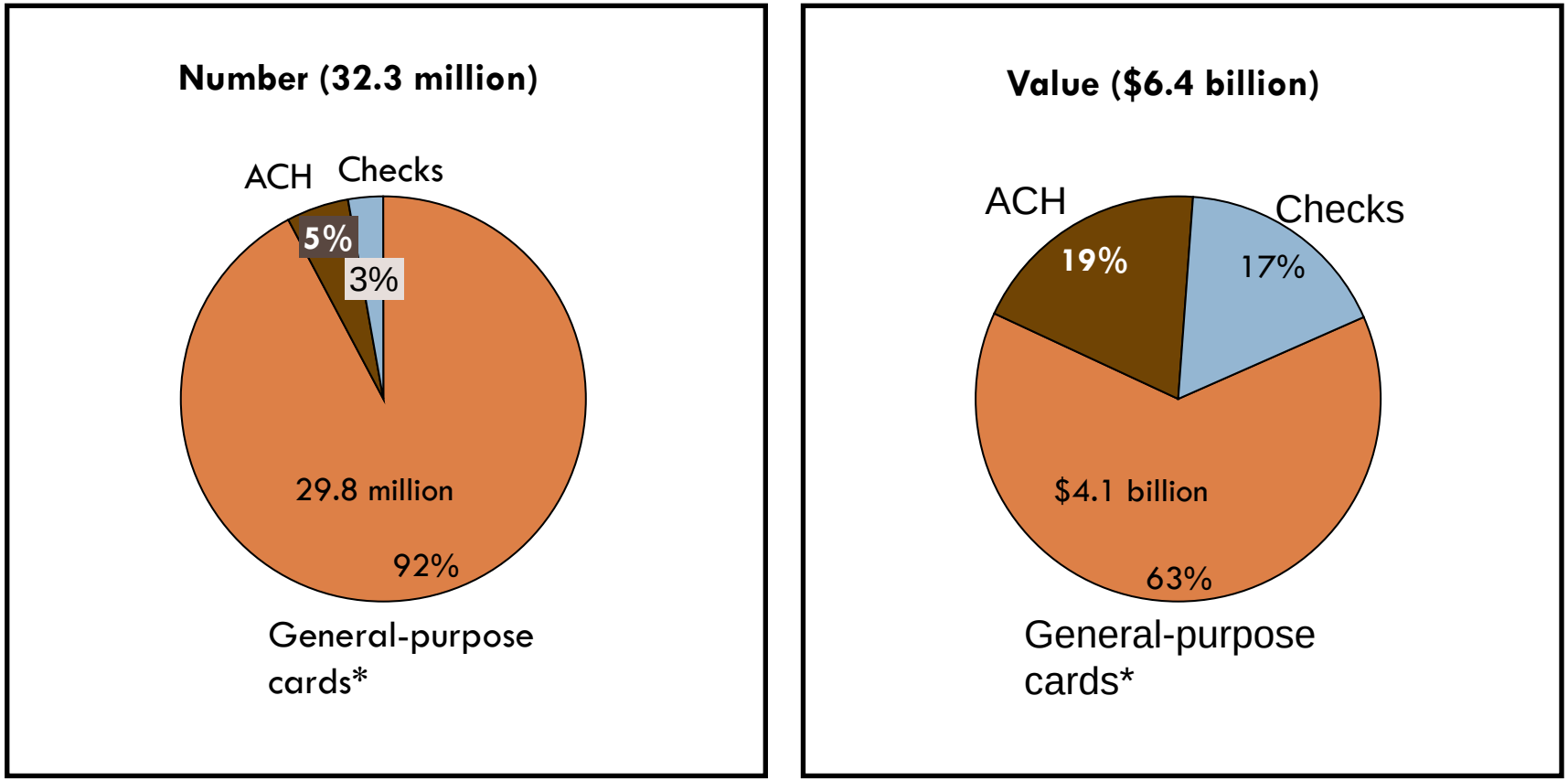
Fraudulent (Unauthorized)
Transactions: $6.4 billion

SOURCE: 2013 Federal Reserve Payments Study

GP Cards: More Unauthorized Third-Party Fraud

10

Distribution of unauthorized third-party fraud transactions in 2012 among GP cards, checks, and ACH



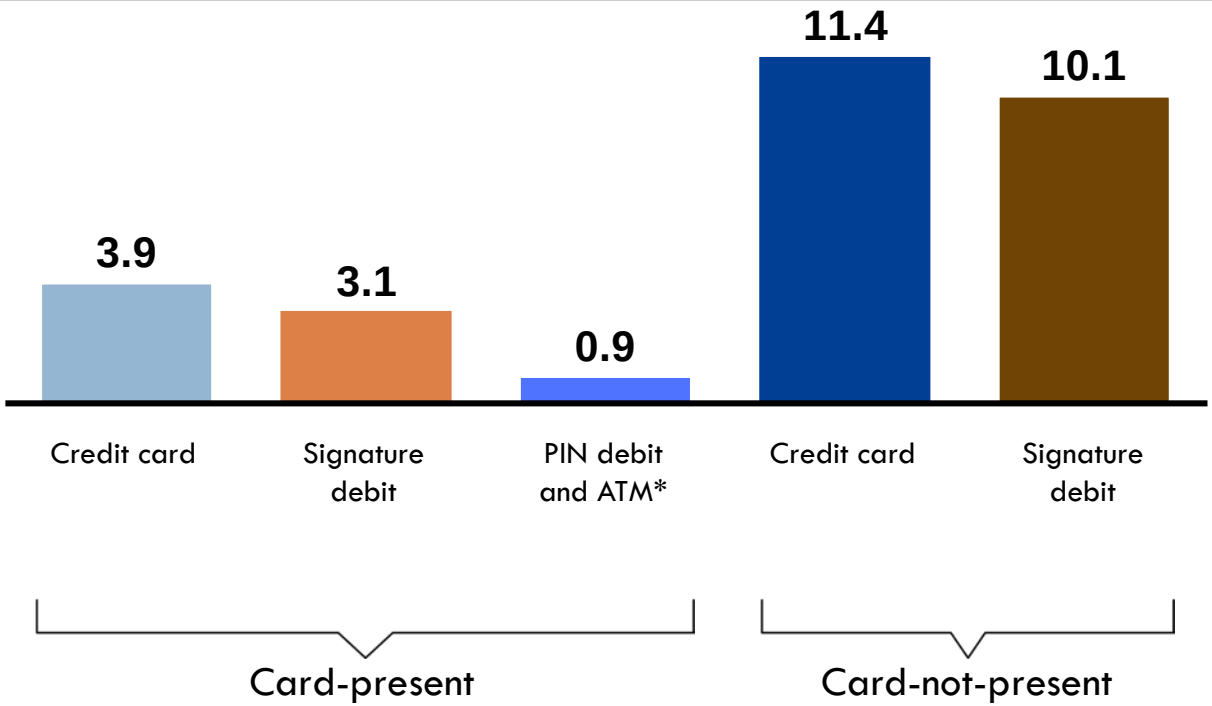
*General-purpose cards include credit, debit, and prepaid payments as well as ATM withdrawals. Figures may not sum because of rounding.

SOURCE: 2013 Federal Reserve Payments Study

CNP Fraud was 3x More Likely Than CP Fraud: PIN was Lowest

Rate of unauthorized third-party fraud transactions (number) in 2012, by type of general-purpose card transaction

Basis points



Includes general-purpose cards only. Debit includes prepaid. Basis points are the number or value of unauthorized third-party fraud transactions per 10,000 transactions or $10,000 spent, respectively. One hundred basis points equals 1 percent.
*ATM withdrawal portion is 2.2 basis points.

SOURCE: 2013 Federal Reserve Payments Study

EMV = Europay, MasterCard, Visa

PHOTO: JOANNA STERN/THE WALL STREET JOURNAL

EMV = Europay, MasterCard, Visa

- 1994: Founded the global standard for credit and debit payments based on chip card technology
- "Chip cards," "chip and PIN cards," and "smart cards" are used interchangeably
  - Plastic cards that contain a microchip that sends a dynamic protected value unique to each transaction
- Though "chip and PIN" is often used with EMV, the standards allow for cardholder verification via signature (PIN is most common in other countries - U.S. implementation: "chip and choice")
- U.S. is one of the last developed nations to implement
  - Merchant reluctance due to high cost of upgrading payment terminals, or buying new ones, to accept chip payments
  - Card issuer reluctance due to cost of reissuing credit and debit cards
  - Cost of terminal and card migration will be high – estimates started at $8B*

EMV & the "Liability Shift"

- As the October 2015 conversion deadline approached, card issuers ramped up EMV issuance
  - About 70 percent of credit cards already issued to consumers have an EMV chip*
- Thirty percent of U.S. merchant locations, or 1.4 million storefronts accept EMV cards*
  - Mercator estimates that by end of year, 41% of customer facing POS terminals will be EMV-enabled
- Merchants that didn't upgrade to EMV POS equipment by October 2015 (October 2017 for automated fuel dispensers) experienced a liability shift, to them, for many fraudulent CP purchases

*June 20, 2016, Digital Transactions

EMV and Online Transactions

- EMV does not address online card fraud (CNP)
- Possible solutions:
  - Two-factor or Multi-factor Authentication
    - Synchronous dynamic password tokens
  - 3DSecure (Verified by Visa, MasterCard SecureCode, Amex SafeKey, etc.)
  - Online PIN Debit (e.g., Acculynk's PaySecure, which uses a "floating PIN pad")
  - Card readers at home
  - Perhaps in-app payments

Emerging (Alternative) Payments Landscape

Card-for-all-Cards

- Combine consumer's cards onto one card or device
  - Credit, debit, prepaid, and loyalty
- Coin – Up to eight mag stripe cards
- Plastc – Up to 20 mag stripe or EMV cards
- LoopPay – Up to 50 mag stripe or EMV cards
- Wocket – Up to 10,000 mag stripe cards
- Stratos – Unlimited mag stripe cards

Mobile Technology

=

…and now

Mobile Payment Apps

Starbuck's 2D Barcode

LevelUp

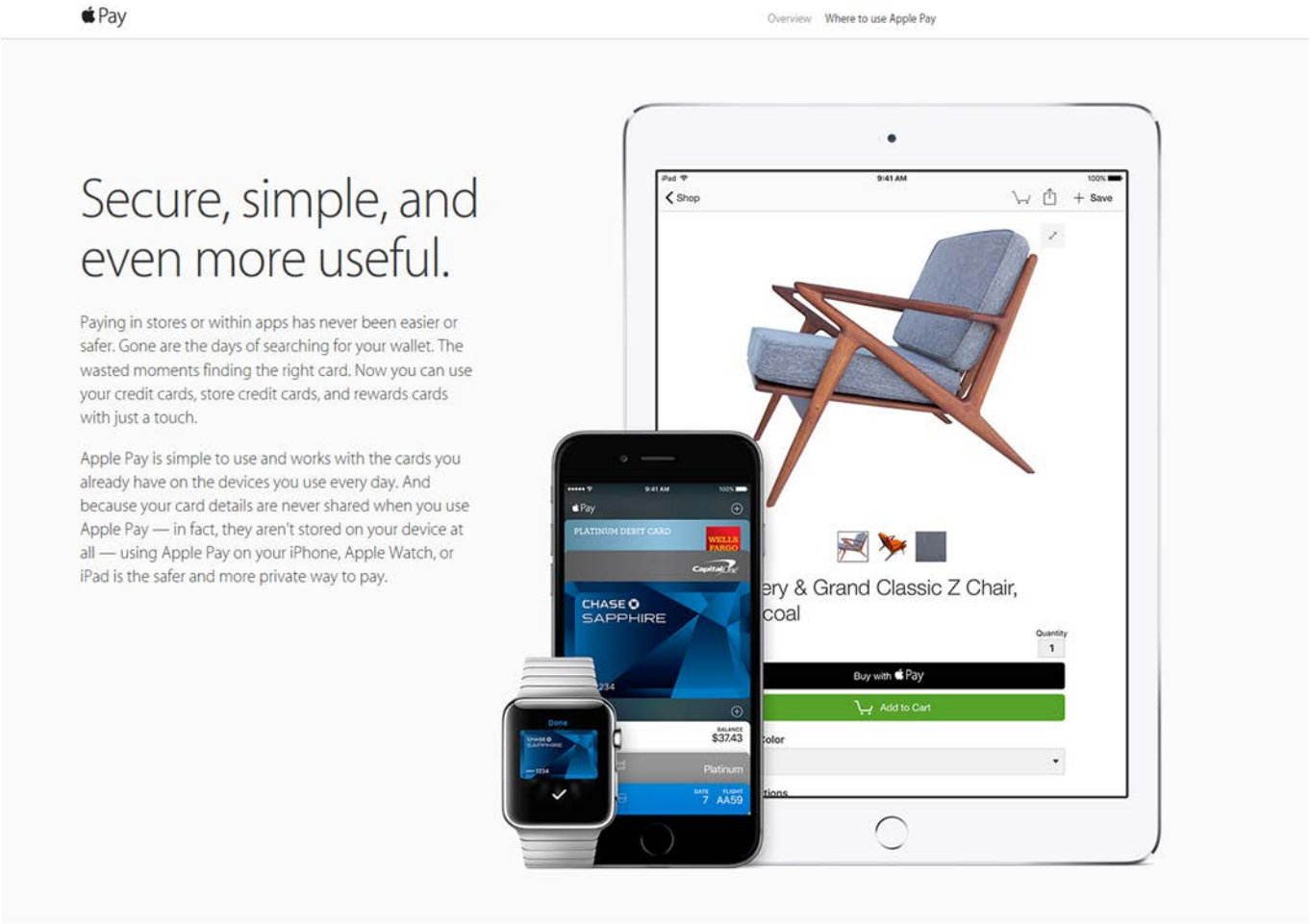
Walmart Pay
(…soon CVS Pay)

Mobile Payment Apps/Wallets

	Technology	NFC	Code-based	Cloud-based	MST
1	Examples	Android Pay, **Apple Pay**, Samsung Pay, ~~**Soft Card**~~, Microsoft Wallet, CU Wallet	**Starbucks**, **LevelUp**, ~~**CurrentC (MCX)**~~, Walmart Pay, CU Wallet	PayPal, CU Wallet	Samsung Pay
2	Required Investment Consumer	Moderate – NFC-enabled smartphone	Minimal – Smartphone	Minimal – Smartphone	Moderate – Smartphone
3	Required Investment Merchant	Significant – NFC-capable POS terminals; Software installation and integration with accounting system	Moderate – QR code scanners; Software installation and integration with accounting system	Moderate – Software installation and integration with accounting system	Minimal – Works with a merchant's existing POS system
4	Business models - Participants	Mobile wallet providers; Hardware providers; Tech providers; App vendors; Mobile network operators; Card issuers/Networks; Handset providers	Mobile payment provider; Hardware providers; Tech providers; App vendors;	Mobile payment provider; Tech providers; App vendors	Mobile network provider; Mobile network operators; Card issuers/Networks; Handset providers
5	Business models - Coordination and collaboration besides merchants	Important	Less important	Less important	Important
6	Funding Sources	Debit, credit, and prepaid cards	Debit, credit and/or prepaid cards	Bank account and/or debit, credit, and prepaid cards	Debit and credit cards

Mobile Wallets

- GAME CHANGER?????



Apple Pay: Overview

- Uses NFC to enable contactless payments at the POS (only with iPhone 6 or above and Apple Watch)
- Uses a secure element chip in the device to store payment information -- though not the actual card number (tokenization)
- At roll-out participating issuers included Amex, BoA, Capital One, Chase, Citi, Wells; now supported by 2,500 card-issuing banks
- Participating networks include Amex, MasterCard, Visa and Discover
- At roll-out 31merchants were participating, with 220,000 U.S. locations in all; now Apple reports over 2M US retail locations
- Now allows use of Kohl's card to pay with Apple Pay; soon will add JC Penney and other store credit cards
- Also allows Walgreen's Balance Rewards card to be added to the wallet; soon Dunkin' Donuts DD Perks and MyPanera
- Also can be used for online, in-app purchases on iPad Pro, Air 2 and minis 3 & 4; soon Mac too

Apple Pay: Merchant Acceptance

Apple Pay Merchants (more than 2 Million U.S. merchant locations)			
Acme	Foot Locker	Peet's Coffee	*Albertsons*
Aeropostale	Fuddruckers	Petco	*Anthropologie*
American Eagle Outfitters	GameStop	Radio Shack	*B&H*
Apple Store	Golden State Warriors	**Rite Aid**	*Basking Robbins*
Au Bon Pain	Harveys	Rubio's	***Best Buy***
Babies R Us	House of Hoops	Run	*BevMo!*
Bashas'	Jamba Juice	Save Mart Supermarkets	*Big Lots!*
BiLo	jetBlue	Sephora	*Carmike Cinemas*
BJ's	Jewel Osco	Shaw's	*Dunkin' Donuts*
Bloomingdales	KFC	Six:02	*Edition*
Champs	Kids Foot Locker	Sports Authority	*El Pollo Loco*
Chevron	Kohl's	Sprouts	*Forever 21*
Chick-fil-A	Lady Foot Locker	Staples	*Free People*
Chili's	Lego	Star Market	*Jersey Mike's*
Coca Cola	Lin's Fresh Market	Starbucks	*JCPenney*
Crate & Barrel	Luby's	Subway	*Jonny Rockets*
Dan's Fresh Market	Lucky	Texaco	*Levi's*
Davis Food & Drug	Maceys	Toys R Us	*L.L. Bean*
Dick's Fresh Market	Macy's	United Supermarkets	*Marriott*
Disney Store	McDonalds	Unleashed	*Raley's*
Duane Reade	Meijer	Walgreens	*Regal Cinema*
Express	Nike	Wegmans	*Renaissance Hotels*
Extra Mile	Office Depot	Walt Disney World	*T Mobile*
Firehouse Subs	Office Max	Whole Foods	*Trader Joe's*
Food Max	Orlando Magic	Winn Dixie	*Urban Outfitters*
Foot Action	Panera		*White Castle*

Apple Pay Apps (online)	
airbnb	Lyft
Apple	MLB.com
B&H	Open Table
Best Buy	Panera
Cavier Fastbite	Pinterest
Chairish	Postmates
Cole Haan	Priceline.com
Disney Store	Print Studio
Dunkin' Donuts	RadPad
Etsy	Sephora
Eventbrite	Spring
Fancy	Staples
Groupon	Starbucks
HauteLook	StubHub!
Hotel Tonight	Target
Houzz	Ticketmaster
Instacart	Uber
Jackthreads	Zappos
KickStarter	Zulily
Levi's Stadium	

Source: Apple.com

CurrentC Merchants (more than 110,000 U.S. merchant locations)				
76	Circle K	HMS Host	Michaels	Seasons 22
7-Eleven	Conoco	Hobby Lobby	Mobil	Sheetz
Acme Fresh Market	CVS	HyVee	My Goods Market	Shell
Alon	Dick's Sporting Goods	K Mart	Old Navy	ShopRite
Bahama Breeze	Dillard's	Kohl's	Olive Garden	Southwest Airlines
Banana Republic	Dunkin Donuts	Kwick Trip	Philips 66	Sunoco
Baskin Robbins	Eddie V's	Kum & Go	Price Rite	Target
Bed Bath and Beyond	Exxon	Longhorn Steakhouse	Publix	Walmart
Best Buy	Face Values	Lowe's	QuickTrip	Wawa
Buy Buy Baby	Gap	Maggiano's	RaceTrac	Wendy's
The Capital Grille	GetGo Giant Eagle	Market District (Giant Eagle)	**Rite Aid**	Yard House
Chili's	Giant Eagle	Market District Express	Sam's Club	
Christmas Tree Shops	GetGo Express	Meijer	Sears	

Source: MCX.com

Apple Pay: How It Works

Set-up

- Automatically uses the card(s) on file with Apple's iTunes as the default payment account; users with iTunes accounts just need to enter the card security code to get started
- Additional debit and credit cards can be added by taking pictures of them with the phone's camera, or by typing the card details into Passbook
- Apple verifies the account data with the card issuers and places digital renderings of the cards in Apple's Passbook wallet app
- The stored cards will be assigned a unique device account number, encrypted and stored in a secure element chip in the phone

Apple Pay: How It Works

Paying

- When making a payment, the device account number and a dynamic security code are used to complete the transaction
- iPhone's TouchID fingerprint scanner is used as the form of user authentication
- Neither Apple nor merchants see or store any private information
- Still get rewards points on the payment cards used

Mobile Wallets

- GAME CHANGER? Quite possibly…
- Mobile wallet providers buying CFAC providers

- Mobile wallet providers buying other providers

- Financial institutions developing mobile wallets

Fraud Techniques
Example - Apple Pay

- Not an issue of fraud with Apple Pay itself, but…
- Fraud stemming from faulty verification of consumer's identity
- Criminals with stolen card numbers may provision them to iPhones
- FIs might verify cardholder's ID w/ date of birth, e-mail address, etc.
- That info might also be known to criminals
- Criminals use that data with compromised card data they bought online, and set up an apparently legitimate account

Fraud Techniques
Example - Apple Pay

- PNC Bank (Pittsburgh): 35 cases of fraud out of thousands of Apple Pay customers
- Apple's own stores often targeted
  - Fraudsters buy new iPhones and load them with other fraudulent accounts
- FIs can strengthen their processes for verifying new cards:
  - Don't just validate "static account data" such as last 4 digits of SSN, DOB, e-mail address
  - Require cardholder to call in to get the card set up on Apple Pay; ask for more than the basics
  - Ask customers to authenticate their phones with TouchID
  - Send the customer an alert each time his Apple Pay account is used

"Apple Pay Stung by Low-Tech Fraudsters," by Robin Sidel and Daisuke Wakabayashi, *The Wall Street Journal*, Mar. 6, 2015

Security and Fraud Implications

	Mobile Wallet	Technology	Compatibility	Authentication	Security	Payment Options	Loyalty	Reach
1	Apple Pay	NFC	iPhone 6 and 6S, Apple Watch	Biometric/Fingerprint	Tokenization	Network-branded credit and debit cards	√	774 million phones*; 2M+ merchant locations (US) 250K merchant locations (UK)
2	Android Pay/ Google Wallet**	NFC	any Android smartphone running Android 4.4 KitKat or newer	Biometric/Fingerprint or Security Passcode	Tokenization	Debit, credit, and prepaid cards	√	6 million phones; 1 million US retail locations
3	Samsung Pay	NFC MST	Galaxy Note 5, Galaxy S6 Edge+, Galaxy S6 Edge, Galaxy S6	Biometric/Fingerprint; or Samsung Pay PIN	Tokenization	Debit, credit, and prepaid cards	√	Approximately 30 million merchant locations worldwide
4	~~CurrentC~~	QR Code (need Wi-Fi)	Most smartphones - download app from App Store or Google Play	PIN – each time the app is opened or when switching between apps	Tokenization	Checking Account, Merchant debit***, credit and gift Cards	√	Any US merchant location that has an NFC-enabled terminal

*As of October 2015, http://ipod.about.com/od/glossary/f/how-many-iphones-sold.htm.

**Google Wallet is now essentially an app used for P2P payments, competing against PayPal, Square Case, Venmo and others.

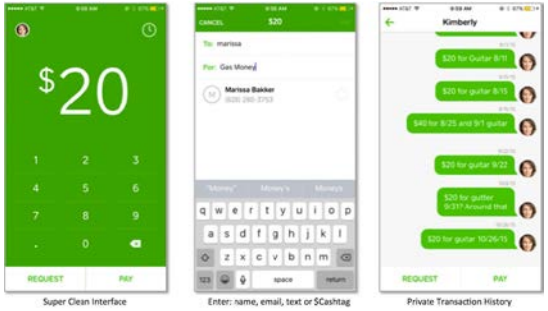
***A PIN may need to be entered if requesting cash back from a merchant debit card purchase.

Alternative P2P Payments

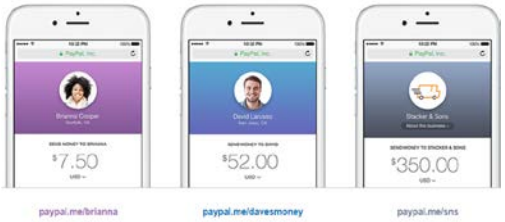
venmo

Facebook Messenger

SQUARE CASH



PayPal.Me



Google Wallet

DWOLLA

TransferWise

Bank and Network P2P Payments

clearXchange

Bank of America | Capital One | JPMorganChase | usbank | WELLS FARGO

popmoney

CHASE QuickPay

People Pay

MasterCard MoneySend

VISA DEBIT

Virtual Currency

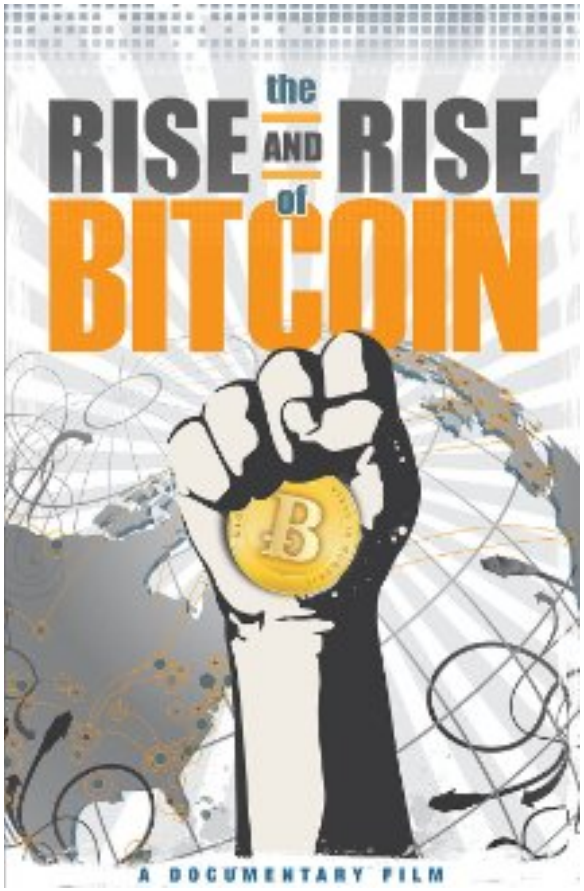
What is a virtual currency (VC)?

- "A type of stored-value product or digital money, which is issued and usually controlled by its developers, and used and accepted among the members of a virtual community."
- Generally used in electronic, web-based transactions

Types of Virtual Currencies

Type	Description	Convertible to Traditional Currency?	Can be used to purchase real goods and services?	Example
Closed	Earned and spent only in virtual environment or community	No	No	Facebook Credits World of Warcraft
Unidirectional	Purchased using traditional currency or earned by participating in virtual activity	No	Yes	Airline miles/points Amazon Coins
Bi-directional	Purchased with traditional currency, can be exchanged between users, and used in the "real" world	Yes	Yes	Bitcoin Litecoin Ripple (XRP)

Revolutionary or Flash in the Pan?



"We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run."

Roy Amara, Researcher and Scientist, formerly with the Institute for the Future

Images bitcoindoc.com

The Fed and Virtual Currency

What's the Fed got to do with it?

- Supervision
  - VC activities of a supervised bank/BHC may be subject to examination for compliance with regulations (including BSA/AML).
- Research
  - Monitoring developments and potential implications for bank supervision, monetary policy, and the payment system.

Other Key Policy Questions

Cash and/or Digital Cash

- How much and how long should the Treasury/Fed continue to produce and distribute cash or should it create a cryptocurrency version of the US dollar?

New VC DIs

- Should VC depository institutions be regulated and how?

Anonymity

- What are the benefits and considerations of anonymity in payments?

"What Community Bankers Need to Know About Virtual Currencies"

- How are banks expected to manage the risks associated with customers using virtual currency? (Compliance Risk)
- Can conducting business with a virtual currency firm be bad for business? (Reputational Risk)
- How should a community bank respond if a borrower wants to specifically post virtual currency as collateral for a loan? (Credit Risk)
- What if the bank actually owns the virtual currency? (Operational Risk)

https://cbcfrs.org/articles/2015/q2/virtual-currencies

Strategies for Improving the U.S. Payment System

Five Desired Outcomes will Guide U.S. Payments System Improvements

A ubiquitous, faster electronic solution(s) exists for making a broad variety of business and personal payments, and the Federal Reserve provides a flexible and cost effective means for private sector arrangements to settle their positions rapidly and with finality.

Greater electronification of payments originated and received has reduced the average end-to-end (societal) costs of payments transactions and resulted in innovative payment services that deliver improved value to consumers, businesses, and governments.

Consumers and businesses have better choice in making convenient, cost-effective, and time cross-border payments from and to the United States

U.S. payment system security is very strong, public confidence in it is high, and protections and incident response have kept pace with the rapidly evolving and expanding threat environment.

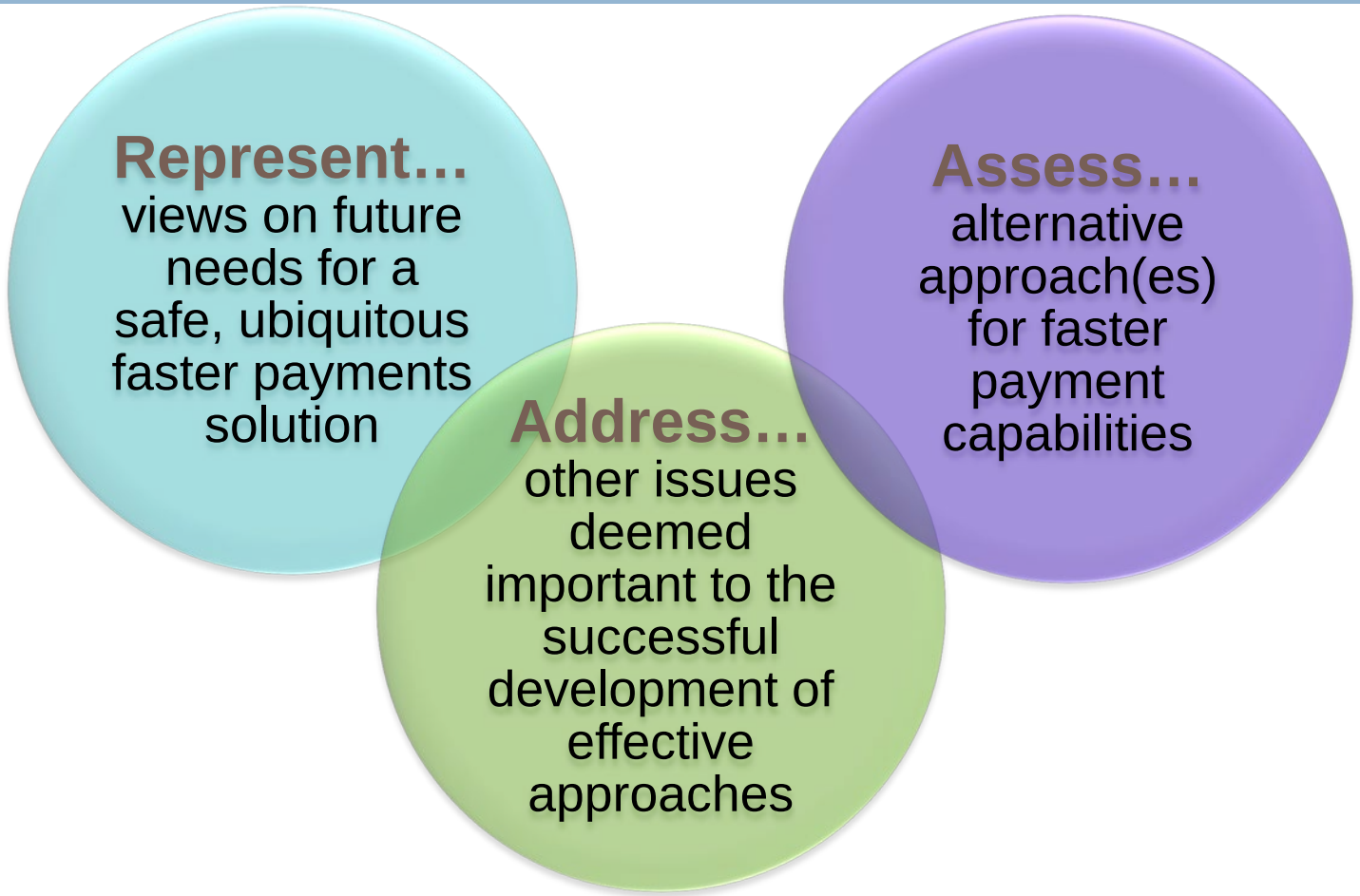
Key improvements for the future state of the payment system have been collectively identified and embraced by a broad array of payment participants, and material progress has been made in implementing them.

Faster Payments Task Force

Mission

Identify and evaluate approach(es) for implementing a safe, ubiquitous, faster payments capability in the United States

Faster Payments Task Force Objectives



Expected Task Force Life Span:

Target completion of efforts is expected 1Q 2017

Secure Payments Task Force

Mission

Provide a forum for stakeholders to advise the Fed in its leader/catalyst and operator roles on payment security matters, and identify and promote actions that can be taken by payment system participants collectively or by the Federal Reserve System

Secure Payments Task Force High-Level Work Plan

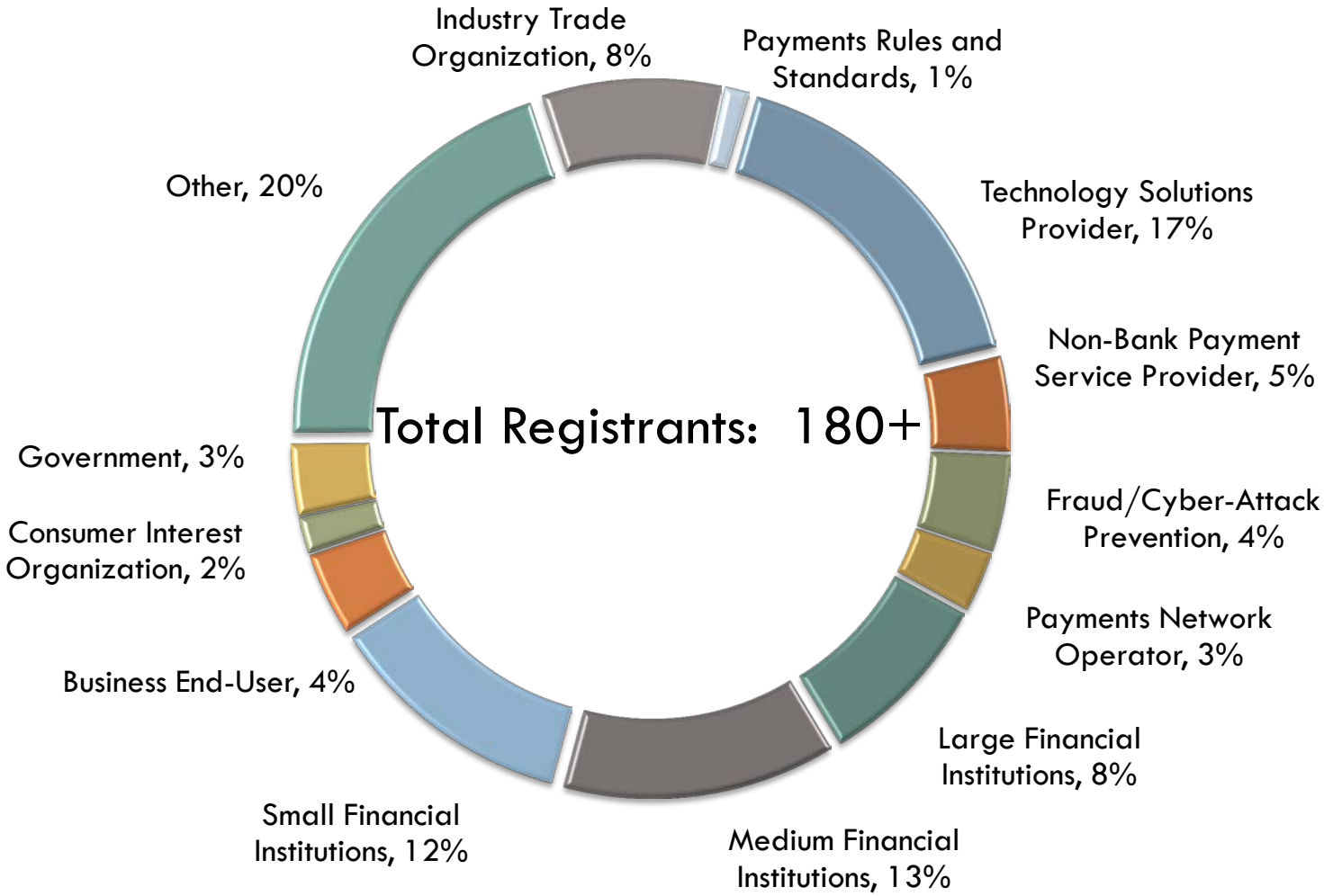
Objective 1
Coordinate with the Faster Payments Task Force

Objective 2
Determine areas of focus for payment security and priorities for future action

Objective 3
Work stream(s) will be organized around an ongoing advisory role to the Federal Reserve

Expected Task Force Life Span:
Target completion of efforts is TBD

Secure Payments Task Force Composition



Secure Payments Task Force Steering Committee

Financial Institutions

Small

- Chris Gilbert, Bankers' Bank of Kansas
- Stephen Ranzini, University Bank

Medium

- Anthony Meholic, The Bancorp

Large

- Frank Perrelli, BNY Mellon
- Glen Ulrich, U.S. Bank

Non-Bank Providers

- Terrence Griffin, CO-OP Financial Services
- Matt Wilcox, Fiserv
- Nancy O'Malley, MasterCard
- Victoria Strayer, TSYS
- Dave Faoro, Verifone, Inc.

End Users

Government

- Cedric Menchion, Killeen Independent School District

Business

- Trent Addington, Best Buy
- Reed Luhtanen, Wal-Mart Stores, Inc.

Consumer Interest

- Suzanne Martindale, Consumers Union

Other Industry Segments

- Stephen Mott, BetterBuyDesign
- Brian Peretti, Department of the Treasury – OCIP

Secure Payments Task Force
Next Steps – Upcoming Meetings

Task Force (TF) Steering Committee (SC)	Dates	Location
Steering Committee Teleconference	Apr 12 or 13	Phone
Task Force Teleconference	TBD	Phone
Steering Committee Teleconference	June 1	Phone
Task Force Meeting	June 21-22	Chicago
Steering Committee Teleconference	July 21	Phone
Task Force Teleconference	TBD	Phone
Steering Committee Meeting	Aug 24-25	Atlanta
Task Force Teleconference	TBD	Phone
Steering Committee Teleconference	Oct 12	Phone
Task Force Meeting	Nov 1-2	TBD
Steering Committee Meeting	Dec 6-7	TBD

Join the FedPayments Improvement Community!

Receive communications and invitations to live/virtual forums, surveys, industry-/ Fed-sponsored groups and events, and online feedback mechanisms.

Connect with us…

Payments Exchange Blog: FedPaymentsImprovement.org

@FedPayImprove

FedPayments Improvement

FedPayments Improvement

Questions?

- Terri Bradford
  - Terri.R.Bradford@kc.frb.org
- 2013 Fed Payments Study
  - http://www.frbservices.org/communications/payment_system_research.html
- *Coming soon 2015 Fed Payments Study…*
  - *Summary information likely in December; use the same link as above*
- Fed Payments Improvement
  - http://fedpaymentsimprovement.org/