



THE U.S. PATH TO FASTER PAYMENTS

FINAL REPORT PART ONE:
THE FASTER PAYMENTS
TASK FORCE APPROACH

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PREFACE

The Faster Payments Task Force is a broad and inclusive group of payment industry stakeholders with representatives from organizations across the payment ecosystem, including financial institutions, non-bank payment providers, regulators, standards bodies, consultants, businesses (merchants and corporates), and consumer groups. The Federal Reserve assembled the task force to collaboratively identify and evaluate alternative approaches to implementing safe, ubiquitous, faster payments capabilities in the United States.

The task force continues to work toward this goal, and is expected to culminate its efforts in mid-2017 when it will publish its assessment of faster payments capabilities, analysis of remaining challenges and opportunities, and recommendations for successful implementation of faster payments in a final report.

In an effort to continue the dialogue within the payment industry and with the general public, the task force has decided to release its final report in two parts. This is Part One of the final report. It describes the background and process of the task force's work and its motivation for pursuing faster payments solutions in the context of the current payments landscape. The task force will complete

and publish Part Two of the report in mid-2017 to share its assessment of proposals for faster payments solutions, and recommend next steps for the industry to take to achieve safe, ubiquitous faster payments capabilities.

This publication, Part One of the Final Report, focuses on two topics. The first section provides a description of the task force's mission and process. The second section provides greater detail about the motivation behind the task force's work in the context of the current payments landscape—explaining why the task force came together to identify and evaluate effective faster payments solutions in the United States.

Acting primarily as a catalyst, the Federal Reserve has encouraged and supported payment stakeholders in coming together in a collaborative effort to understand how to progress toward payment improvements in a complex economic environment. This report reflects the broader task force's analysis and collective views.

Statements contained in this report do not necessarily reflect the specific position of any or all task force participants, nor do they necessarily reflect the views of the Federal Reserve.



SECTION 1

BACKGROUND AND PROCESS

INTRODUCTION

In early 2015, the Federal Reserve issued the Strategies for Improving the U.S. Payment System paper that outlined the collective thinking of U.S. payment system stakeholders and the Federal Reserve on desired outcomes for improving the U.S. payment system. The desired outcomes include improvements in speed, security, efficiency, cross border payments, and industry collaboration. This effort was the culmination of several years of collaboration between the Federal Reserve and industry stakeholders to set a vision for modernizing payments in the United States.

The Federal Reserve’s strategies paper called upon payment system stakeholders—including financial institutions, non-bank providers, businesses, retailers, consumer groups, standards bodies, and other organizations involved in making, receiving, and processing payments—to form two task forces: the Faster Payments

Task Force (“task force”) and the Secure Payments Task Force.¹ These task forces, and the efforts leading up to their formation, leveraged a desire and a commitment among industry stakeholder groups to collaborate on a vision to achieve system-wide evolution.

The Faster Payments Task Force was convened by the Federal Reserve in May of 2015. The task force has focused its efforts on identifying goals and attributes of effective faster payment systems; proposing solutions and assessing their capability to achieve those goals; and championing the payment industry to take steps toward implementation and adoption of faster payments capabilities. The Federal Reserve serves to support the task force in its progress toward these outcomes by facilitating task force meetings, providing resources to assist task force work efforts, and soliciting participation from volunteers across the payment industry.



TASK FORCE MISSION & OBJECTIVES

As stated in the Faster Payments Task Force Charter, the mission of the task force is to “identify and evaluate alternative approaches for implementing safe, ubiquitous,² faster payments capabilities in the United States.” This mission supports a key desired outcome identified in the Federal Reserve’s strategies paper, to achieve:



“A ubiquitous, safe, faster electronic solution(s) for making a broad variety of business and personal payments, supported by a flexible and cost-effective means for payment clearing and settlement groups to settle their positions rapidly and with finality.”

To accomplish this mission, the task force set out to achieve several important objectives as stated in the original charter:

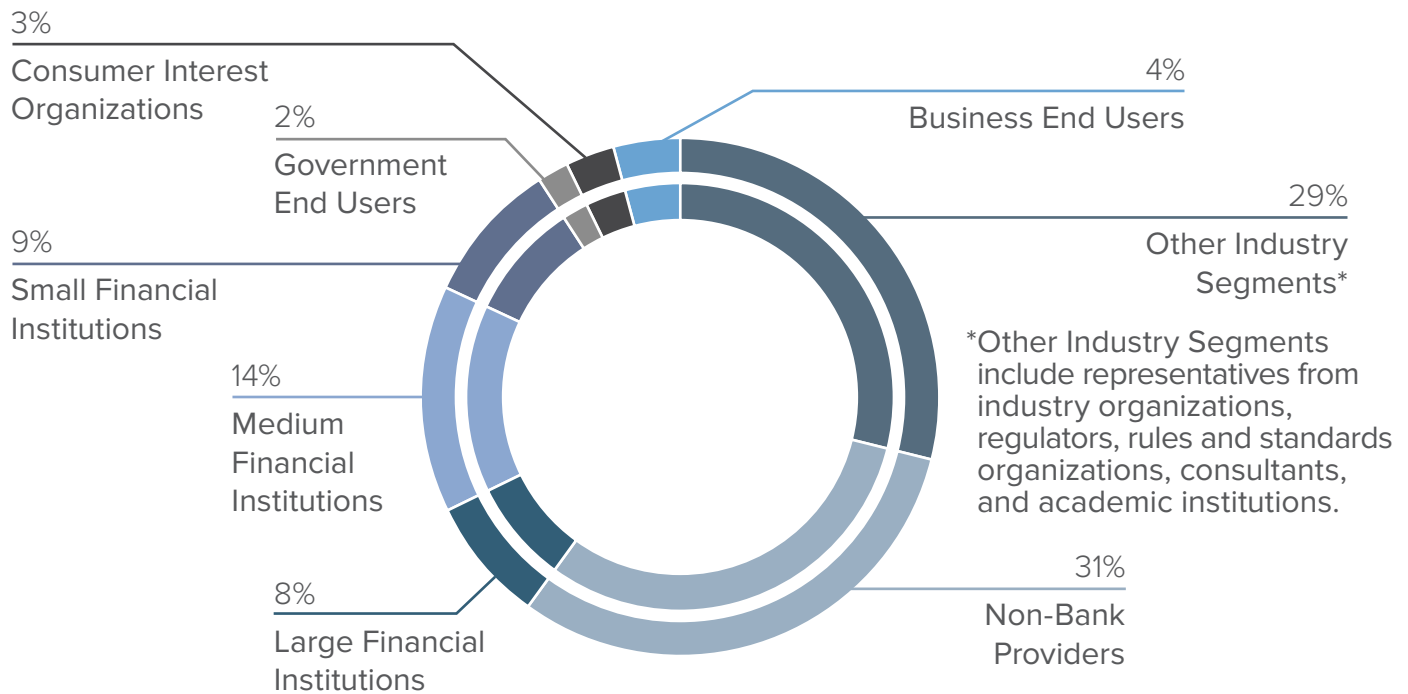
- Represent diverse stakeholder views on future needs for safe, ubiquitous faster payments solutions
- Assess alternative approaches for faster payments capabilities, including:
 - Description of the core infrastructure, including access model;
 - Security and operational changes needed for participants to interface with the infrastructure;
 - Estimated cost and time to implement; and
 - Other factors deemed important to determine the effectiveness of an approach.
- Address other issues that arise through task force discussion that are deemed important to the successful development of effective approaches for implementing faster payment capabilities.



As task force work has progressed, the execution of these objectives has shifted over time through the development of various task force work products. Initiatives to accomplish the task force’s objectives have centered on identifying desired attributes of effective faster payment models, soliciting proposals for faster payments solutions, assessing the ability of each solution to deliver these attributes, and identifying remaining challenges and opportunities for faster payments implementation.

TASK FORCE REPRESENTATION

**FIGURE 1: FASTER PAYMENTS TASK FORCE SEGMENT REPRESENTATION
320 PARTICIPANTS AS OF DECEMBER, 2016**



To ensure comprehensive perspectives and stakeholder views were represented in the initiative the Federal Reserve engaged a diverse set of participants and maintains an open call for anyone interested to join the task force, continually recruiting to seek a balanced membership of payment stakeholders. Task force participants represent eight stakeholder segments (referred to as “segments”) as shown in Figure 1.

Each of these eight segments elected representatives to serve on the Faster Payments Steering Committee, an advisory body coordinating with broader segment membership to establish segment-specific positions and provide guidance on key decisions. The 18 steering committee members, with balanced representation across segments, maintain a pulse on segment views as they recommend approaches for achieving milestones in the phases of task force work.

The task force also established smaller work groups to address specific issues emerging over the course of their work. Volunteer work groups analyzed topics such as the legal framework, rules and standards, safety and security, governance, adoption, interoperability, and other key issues that might affect the successful implementation of faster payments solutions. While stakeholder segment groups frequently worked together to refine their views, task force participants largely collaborated across industry lines and segments to avoid sector bias.

In addition, the Faster Payments Task Force worked closely with the Secure Payments Task Force on establishing criteria to measure the security of faster payments solutions. The two task forces continue to collaborate on security-related issues such as evaluating broader security challenges and opportunities for faster payment systems.

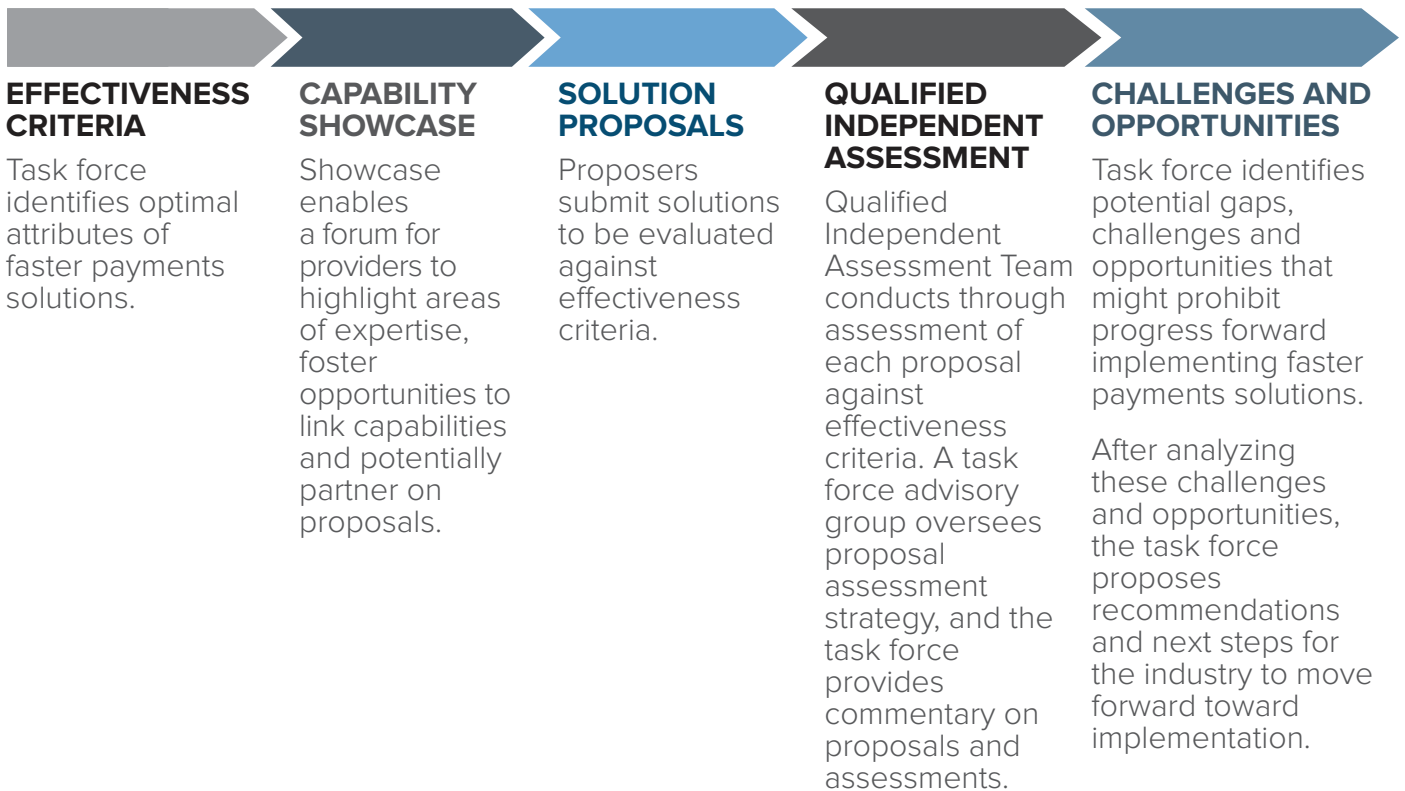
TASK FORCE PROCESS

With facilitation support from the Federal Reserve, the task force participates in the development of the project plan, process, work products, and key decisions through face-to-face meetings, teleconferences, segment calls, webinars, surveys and other tools designed to gather perspectives and positions. To address the challenges inherent in collective decision making among multiple stakeholder groups, the task force established a decision making framework to ensure all views are captured on key decisions and work products.

Figure 2 shows the major phases of task force work necessary to identify and assess faster payments solution proposals and suggest ways to move toward implementation and adoption of faster payments capabilities across the payment industry. Each of these steps will be discussed in detail in the sections to follow.



FIGURE 2: PHASES OF FASTER PAYMENTS TASK FORCE WORK



EFFECTIVENESS CRITERIA

To support the development and submission of faster payments solution proposals,³ the task force created the Faster Payments Effectiveness Criteria as a guideline for effective faster payments solution design. The Effectiveness Criteria identify desired attributes of faster payments solutions across six categories: Ubiquity, Efficiency, Safety and Security, Speed, Legal, and Governance. Within these categories, the task force created a total of 36 criteria, including definitions and an effectiveness scale for achieving the desired outcome of each criterion.

The criteria's development involved a collaborative and iterative process with the task force as well as engagement and survey input from the broader payments community. To achieve consensus, the criteria were finalized through several face-to-face task force meetings; the formation of a legal work group within the task force to finalize legal criteria; and collaboration with the Secure Payments Task Force on safety and security criteria. Task force participants commented on multiple versions of the criteria, fine-tuning details and language before arriving at a final version that would serve as the foundation for assessing proposals. The process resulted in a 97% consent rate.

Solution proposals are not judged against each other; rather, each proposal is assessed independently against each criterion. The Effectiveness Criteria are not intended as a set of

minimum or maximum requirements for faster payments solutions. Instead, they serve as a guide to assess and differentiate the effectiveness of each solution proposal across many dimensions. There may be tradeoffs or interrelationships between one or more criteria. For example, one might believe that the criterion on usability has tradeoffs with the criterion on security controls. When evaluating a solution against usability, however, the assessment will consider only the usability of that solution, regardless of whether an element of inconvenience in the solution design is tolerable because it increases security. In addition, solution proposals may contain design elements or other features that exceed those described in the criteria.

In addition to serving as a benchmark for the task force's assessment of faster payments solution proposals, the Effectiveness Criteria are intended to provide guidance to the wider payments community and payment system developers on the desired attributes of future payment systems. The Effectiveness Criteria categories and names are listed in Table 1.

In parallel with the Effectiveness Criteria, the Federal Reserve, the Faster Payments Task Force and the Secure Payments Task Force collaborated on a Glossary of Task Force Terms to establish common definitions and terminology for key concepts related to the payment ecosystem and faster payments solution proposals.



TABLE 1: FASTER PAYMENTS EFFECTIVENESS CRITERIA⁴

UBIQUITY	U.1	Accessibility
	U.2	Usability
	U.3	Predictability
	U.4	Contextual Data Capability
	U.5	Cross-Border Functionality
	U.6	Applicability to Multiple Use Cases
EFFICIENCY	E.1	Enables Competition
	E.2	Capability to Enable Value-Added Services
	E.3	Implementation Timeline
	E.4	Payment Format Standards
	E.5	Comprehensiveness
	E.6	Scalability and Adaptability
	E.7	Exceptions and Investigations Process
SAFETY AND SECURITY	S.1	Risk Management
	S.2	Payer Authorization
	S.3	Payment Finality
	S.4	Settlement Approach
	S.5	Handling Disputed Payments
	S.6	Fraud Information Sharing
	S.7	Security Controls
	S.8	Resiliency
	S.9	End-User Data Protection
	S.10	End-User/Provider Authentication
	S.11	Participation Requirements
SPEED (FAST)	F.1	Fast Approval
	F.2	Fast Clearing
	F.3	Fast Availability of Good Funds to Payee
	F.4	Fast Settlement Among Depository Institutions and Regulated Non-Bank Account Providers
	F.5	Prompt Visibility of Payment Status
LEGAL	L.1	Legal Framework
	L.2	Payment System Rules
	L.3	Consumer Protections
	L.4	Data Privacy
	L.5	Intellectual Property
GOVERNANCE	G.1	Effective Governance
	G.2	Inclusive Governance

CAPABILITY SHOWCASE

The task force decided early on that there would be benefits from establishing a forum for providers⁵ to showcase innovative payments capabilities and highlight areas of expertise. This forum was designed to foster opportunities for providers to potentially partner on a faster payments solution proposal.

The Capability Showcase was launched in January 2016, and remains open to future capability submissions. The showcase is a portal-based forum where solution providers, both from the general public and the Faster and Secure Payments Task Forces, can showcase their payments capabilities. Capability showcase providers are not required to join the task force or to submit an end-to-end faster payments solution proposal.

A variety of firms have submitted technology and service capabilities to the showcase—from small startups to large payments and technology companies—offering a range of expertise that could be applied to faster payments solutions.

In this way, component solution providers could potentially partner with other component providers or firms intending to propose an end-to-end payments solution. As of December 2016, over 30 firms submitted product descriptions and short videos to the online capability showcase portal. In addition to the online portal, the Faster Payments Task Force also hosted office hours—an in-person opportunity for submitters to present their payments capability to the Faster Payments Task Force community. Office hours took place in Chicago in February 2016, with 23 submitters participating.

The showcase and office hours serve to highlight resources that could support the overall goal of evolving the payment ecosystem. Participating providers have featured solutions designed to impact payment speed, security, cross-border capability, efficiency, risk management, rules and governance. A list of showcase participants is provided in [Appendix 2](#).



SOLUTION PROPOSALS

In early 2016, the task force solicited proposals for faster payments solutions that could address the need for fast, safe, ubiquitous payments as set forth in the Effectiveness Criteria. To submit a proposal, organizations were required to sign a participation agreement to join the Faster Payments Task Force. Task force participants were able to submit proposals independently or team up with other task force participants to propose a joint solution. The deadline to submit solution proposals was April 30, 2016.

The task force also developed a template for the solution proposers to use in describing their solution. The template was designed to ensure that proposers submitted consistent and complete information necessary to assess proposals against the Effectiveness Criteria.

The proposal template required proposers to detail what their solution does at each stage of the end-to-end payment process—from the initiation of a transaction through the completion of a payment and reconciliation of account balances. Proposers were asked to describe each use case⁶ supported by their solution, such as payments between two people or payments made by a business to a consumer, and to explain features that applied to each use case. In addition, the template asked proposers to include business considerations for launching their solution, such as the expected length of time it would take to achieve ubiquity in the market, the intended value proposition, and other integration considerations. Proposers were also asked to provide a self-assessment of their solution proposal, including a detailed description of how their solution meets each of the Effectiveness Criteria.



QUALIFIED INDEPENDENT ASSESSMENT OF SOLUTION PROPOSALS

The task force sought to ensure that each solution proposal was evaluated in a consistent, objective way against the Effectiveness Criteria. Importantly, the proposal assessment process was not designed to select winners or rank solutions from best to worst. Instead, each solution was independently measured against the criteria. Ultimately, implementation of proposals will be driven by the private sector.

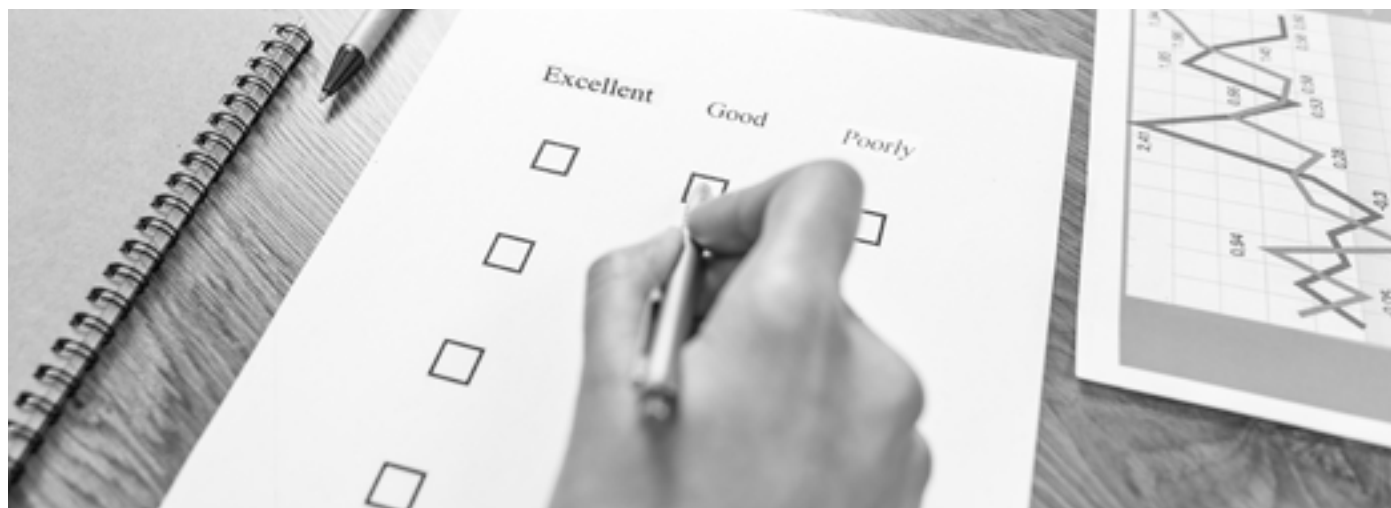
Early on in the development of the proposal assessment process, the task force recommended establishing an external Qualified Independent Assessment Team to conduct objective proposal assessments on behalf of the task force. This recommendation sought to address the potential conflict of the interest that would arise if proposers from competing firms were asked to assess each other. It also addressed a concern by the task force that individual task force participants may not be sufficiently qualified to assess the proposals on all stages of the payment process and across all criteria.

Through a competitive bidding process, the Federal Reserve—on behalf of the task force—selected McKinsey & Company to serve as the Qualified Independent Assessment Team, conducting a comprehensive assessment of each solution proposal against the Effectiveness Criteria. In addition, the task force recommended setting up an Advisory Group from a subset of the steering committee members to ensure that proposals were evaluated

using a consistent, unbiased, objective process and to address any concerns raised by proposers or task force participants throughout the assessment period.

In total, 22 proposals were reviewed by the Qualified Independent Assessment Team in the first phase of the assessment process from May through October 2016. During this initial phase, proposers remained anonymous within the task force. Proposers were given the opportunity to respond to questions and engage in post-assessment dialogue with the assessment team. At that time, proposers could, upon reviewing their assessment, decide to release their proposal to the task force for review or withdraw from the process. Nineteen proposers opted to continue the process of task force review.

After the assessment team concluded the first phase of its work in October 2016, task force participants reviewed the proposals and assessments and participated in activities designed to provide feedback on individual assessments, solution-enriching comments, and overall feedback on process and output. After receiving comments from the full task force, solution proposers have a second opportunity to decide whether or not to remain in the process and release their proposal to the general public. The proposals that remain will be included in Part Two of the task force’s final report, along with the assessment results and task force commentary.



IDENTIFYING CHALLENGES AND OPPORTUNITIES

In addition to reviewing and assessing the effectiveness of individual solution proposals, the task force recognized that a successful implementation of ubiquitous, secure, faster payment solutions will require continued effort to collaborate across the payment industry.

During the assessment period, the task force began to anticipate challenges and opportunities that would need to be resolved to realize successful faster payments implementation in the United States. Task force participants, in advance of reading the proposals, predicted certain areas would require collective consideration to address challenges or opportunities such as rules and standards, interoperability, adoption, governance, and safety and security.

To conduct a thorough evaluation of the issues and their implications, nearly 60 task force participants volunteered to form a Challenges and Opportunities Work Group. This work group was broken down into sub-work groups focusing on specific issues identified through task force dialogue that were to be confirmed during the evaluation of the solution proposals. At the conclusion of its analysis, the Challenges and Opportunities Work Group and the entire task force will refine the challenges and opportunities, form recommendations, and propose next steps for the industry to pursue in support of effective faster payments capabilities in the United States. This information will be included in Part Two of the final report.



A top-down view of a dark leather wallet with a zipper. The wallet is open, revealing several credit cards and a stack of US one hundred dollar bills. The credit cards are arranged in a way that some are partially overlapping. The text 'SECTION 2' is overlaid in large white letters on a semi-transparent blue rectangular background. Below the title, there is a grey rectangular box containing the subtitle text. The background of the entire image is a textured, light-colored surface.

SECTION 2

U.S. PAYMENTS LANDSCAPE
AND BENEFITS OF SAFE,
UBIQUITOUS FASTER
PAYMENTS

INTRODUCTION

Payments are a part of our everyday life—from paying for groceries at a checkout counter, to receiving a salary payment through direct deposit. Every year in the United States, consumers and businesses⁷ make and receive over 140 billion non-cash retail payments with a total value of over 175 trillion dollars⁸ using a variety of methods.

For the majority of these payments, traditional payment methods are used: wire transfers, Automated Clearing House (ACH),⁹ cards, checks, and cash (see [Appendix 3](#) for a description of how each payment method is processed). The market continues to develop a variety of channels to initiate and accept payments, such as online and mobile payment applications, that provide greater speed and convenience for end users¹⁰ while relying on traditional payment methods like cards and ACH.

Traditional and new payment methods provide many options for consumers and businesses to make and receive payments; however, none of today's payment methods fully satisfies the goals for a faster payment system as articulated in the task force's [Faster Payments Effectiveness Criteria](#).

In developing the criteria, the task force considered, in part, areas for improvement in several traditional payment systems and innovations.

The task force determined that while a clear end-user benefit of faster payments involves speed, implementation of faster payments in the United States should lead to faster, safe, and ubiquitous payments.

While traditional non-cash payment methods provide a platform for consumers and businesses to send payments between almost any bank accounts, these systems (with the exception of wire payments, which are typically high-value transfers) are not designed to complete a payment transaction from end to end at the level of speed defined in the Effectiveness Criteria. In order for a solution to be fast, the Effectiveness Criteria state that approval, clearing, availability of good funds, settlement, and notification of payment status should occur within a certain time frame. For example, an effective solution would make good funds available to the payee within one hour, or ideally within one minute. Certain use cases in particular have a need for greater speed—for example, consumers and businesses would benefit from being able to send emergency bill payments, insurance claim payments, or just-in-time supplier payments within the timeframes outlined in the Effectiveness Criteria.

In addition, electronic payment options such as ACH and cards have not been broadly adopted for all types of payments, leading to persistent use of slower and less efficient payment methods. For example, consumers do not have the infrastructure necessary to accept credit or debit card payments or to pay all types of bills electronically through ACH. Additionally, a large number of consumers in the United States do not utilize traditional banking services,²¹ limiting access to electronic payment methods. Some small

businesses also choose not to use electronic payment methods for a variety of reasons, such as lack of acceptance of electronic payments by their business partners or a desire to avoid the cost of infrastructure, fees, or risk of disputed transactions that result in funds being returned to the buyer at a later date. For these reasons, some consumers and businesses still rely heavily on cash and check payments because these methods are already widely used and almost universally accepted.



HOW ARE PAYMENTS PROCESSED?

Payments are an essential part of commerce—facilitating an exchange of value from one entity¹² to another to complete a transaction or settle an obligation. There are many different types of payments, and many ways that payments can take place. (For more detail on how wire, ACH, card, check, and cash payments are processed today, refer to [Appendix 3](#).)

When a payment occurs, there are a number of steps that typically take place before the payment is complete. Table 2 provides short descriptions of each step.

Note that each payment method uses a slightly different processing approach. Some types of payments may not go through each of these steps, or one or more steps may be performed simultaneously. In addition, Table 2 is not meant to indicate that steps must follow a specific order. For example, receipt may take place before or after settlement.

TABLE 2: ANATOMY OF A PAYMENT

INITIATION	The initiation of a payment begins when either the payer or payee in a payment transaction, or a third party, sends an instruction to another entity that triggers a process ultimately leading to a payment.
AUTHENTICATION	The process that verifies the identity or veracity of a participant, device, payment or message connected to a payment system. Authentication may happen at multiple points in the payment process. For example: <ul style="list-style-type: none"> •End-user identity may be verified when the end user enrolls with a provider. •During the payment process, additional checks may be built in to verify the identity of the payer, account, or account provider (e.g., entering a password).
AUTHORIZATION	The explicit instructions, including timing, amount, payee, source of funds and other conditions given by the payer to their account provider or to the payee to transfer funds on a one-time or recurring basis.
APPROVAL BY THE PAYER'S PROVIDER	The point following the initiation of a payment when the payer's account provider verifies that the payer's account has good funds ¹³ or credit necessary to complete the transaction.
CLEARING	The process by which the payer's and payee's account providers exchange payment information to confirm a transaction prior to settlement.
RECEIPT	The point when funds are received by the payee, such that the funds can be withdrawn or transferred. ¹⁴
SETTLEMENT	An act that discharges obligations in respect of funds between two or more entities. ¹⁵
RECONCILIATION	A procedure to verify that the records issued by entities involved in a transaction match. The reconciliation process may include appropriate reversals and post-transaction analysis.

Innovative new payment solutions are being developed to meet demands for greater speed and convenience, but these new solutions cannot easily provide a ubiquitous capability allowing a payment to be sent between any two end users. New payment solutions—such as tools that allow customers to pay in stores with their mobile phones, make payments via social media, and send instant person-to-person transfers between bank accounts or debit cards—have the potential to address many unmet needs in the market. For example, these tools can allow friends or family members to quickly transfer money to each other electronically, rather than using cash or checks. At the same time, new solutions also face many hurdles to gaining broad adoption and permitting payments to be sent seamlessly between all consumers and businesses with interoperability between various solutions. The criteria consider the following factors, among others, that, if effective, could help faster payments solutions achieve ubiquity: the ability to initiate and/or receive payments to/from any entity; a straightforward, simple, and reliable end-user experience; and the ability for end users to make payments anytime, anywhere, using a variety of access channels.

In addition, safety and security are typically addressed in various ways by current payment systems. In considering implementation of faster payment systems, the criteria cover several aspects of safety and security throughout the payment process, including: risk management, handling disputed payments, fraud information sharing, controls, resiliency, and end-user data protection.

Because the implementation of faster payments in the United States may involve the development of new infrastructures, an opportunity exists to create payment systems that better meet stakeholder demand for improvements in not only speed, but also ubiquity, efficiency, safety, security, legal framework, and governance. This report will discuss these topics in more detail, focusing on the task force’s rationale for pursuing faster, safe, ubiquitous payment solutions in the United States at this time; the current payments landscape, both within the United States and globally; and the benefits that faster payments can bring to society and individual stakeholders.



WHY FASTER PAYMENTS? WHY NOW?

The U.S. payment system is at a critical point in its evolution. Improvements in computing speed and information processing allow payments to take place faster than ever before. Non-bank providers such as technology companies have begun to enter the market and develop innovative new solutions to meet the changing expectations of consumers and businesses for faster payment methods. Although innovation is taking place, faster payments solutions are being developed in a fragmented way without collaboration across the payment industry or broad adoption across the market as a whole.

Many countries have already upgraded their payment systems to take advantage of improvements in technology, allowing payments to be sent within seconds between payers and recipients. Given the breadth and complexity of the U.S. market—with over 10,000 depository institutions and hundreds of non-bank payment providers—it is more challenging to implement improvements to the payments infrastructures

in a coordinated way. Individual providers are hesitant to invest in new infrastructure and adopt necessary common rules and business practices until they know that faster payments solutions will gain traction in the market and provide a return on investment. At the same time, consumers and especially businesses are unlikely to adopt new solutions that are not already widely used to make and receive payments. Although technology may be available to implement faster payments solutions, the U.S. payments landscape presents unique challenges for all segments of the market to move forward in a coordinated way to achieve ubiquity.

The Faster Payments Task Force has come together to build on the momentum and innovation already taking place in the industry and to jointly identify the challenges that stand in the way of achieving safe, ubiquitous faster payments solutions. The task force believes that now is the time for the payment industry to implement faster payments solutions for several reasons.

"WITH THE MARKET ALREADY MOVING, THE INDUSTRY NEEDS TO ACT NOW TO PREVENT FURTHER FRAGMENTATION."

Depository institutions and non-bank providers are already developing faster payments solutions, but these solutions cannot easily connect all providers and end users in the market. Some faster payments solutions use closed networks that require payment providers to gain membership to the network to offer a service to their customers. In addition, both the sender and recipient of the payment must set up accounts with an in-network provider before payments can be sent. Further, many new solutions address limited use cases. For example, a solution may only facilitate payments from one person to

another but may not support payments made to or from businesses.

As multiple faster payments solutions have come to market, many have developed independently of each other and have not focused on the ability for any entity to send or receive a payment, across more than one system, to or from any other entity. Realizing ubiquity will depend on industry participants working together to ensure that new payment methods can reach consumers and businesses on a broad scale to deliver innovative products and services that meet a variety of end-user needs.

"BUSINESSES AND CONSUMERS WANT FASTER ACCESS TO PAYMENT STATUS INFORMATION AND FASTER FUNDS AVAILABILITY."

Businesses and consumers have expressed a demand for faster payments¹⁶ and could benefit from the prompt visibility of payment status and faster availability of good funds. Uncertainty in payment timing and delay of funds receipt can be costly to consumers and businesses as they manage their account balances from day to day.

Faster payment solutions can address these challenges by providing prompt and transparent payment status information and allowing faster clearing and good funds availability to the payee. Businesses and consumers can benefit from improved cash flow management and avoidance of overdraft and late fees.

"THE MOVE TO FASTER PAYMENTS PROVIDES AN OPPORTUNITY TO IMPROVE THE USER EXPERIENCE WITH SMARTER, SAFE PAYMENT TECHNOLOGIES."

As providers upgrade current infrastructure or build new systems to send and receive faster payments, this opens up opportunities for improving other aspects of the payment process. Providers of existing payment systems continually work to improve a variety of safety and security features and data capabilities they currently offer; however, these safety and security features and data capabilities are not always standardized or broadly adopted across payments solutions. Faster payments development can leverage lessons learned from the evolution of current technologies to improve the user experience with better data capabilities as well as overall improvements in the safety and security of the payment system.

Many countries that have implemented faster payments solutions have also enhanced the quality and quantity of data transmitted with payments. This allows for faster and easier tracking of payment status and analysis of

payment-related data. Consumer and business expectations for speed, ubiquity, and richness of data are shaped by innovations in email, text, and other communications that can be sent almost immediately anywhere in the world with whatever data is needed. In addition to speeding up payment transactions, the development of faster payments solutions could provide opportunities to meet evolving expectations for data capabilities.

As new faster payments solutions are developed or integrated with existing systems, safety and security features can be built from the ground up based on today's knowledge of vulnerabilities in payment systems as well as any anticipated risks specific to payment speed and finality. If proper controls are in place, such as those defined in the Effectiveness Criteria, faster payments solutions can improve payment safety and security and reduce the risk for various parties involved in a transaction.

"SAFE, UBIQUITOUS FASTER PAYMENT OPTIONS WILL LAY A FOUNDATION FOR FUTURE INNOVATION."

In addition to meeting these immediate end-user needs, safe, ubiquitous, faster payments solutions can promote greater innovation in the future. Recent advances in computing power and telecommunications have led to many changes in the financial industry, and faster payments will provide greater flexibility to keep pace with these innovations. New or enhanced payments

solutions designed with the latest technology and security controls can provide greater adaptability to combat future risks and meet evolving end-user needs. A variety of new financial products and services can be designed on the foundation of faster, safe, ubiquitous payments capabilities.

U.S. PAYMENTS LANDSCAPE

The way we make payments has shifted dramatically in recent years with many new tools and technologies shaping today's market. The market has shifted toward a heavier use of electronic payments, with card payments growing steadily over the years. In particular, the number of debit card payments increased by approximately 14 percent on a compound annual basis from 2000 to 2015,¹⁷ accounting for a greater share of non-cash¹⁸ payment volumes than any other payment type in 2015.¹⁹ ACH

payments continue to replace many payments traditionally made by check, such as salary and online bill payments, and accounted for over 80 percent of the total value of all non-cash retail payments in 2015.²⁰ From 2012 to 2015, the number of checks paid declined by approximately 4.4 percent on a compound annual basis.²¹ Although paper checks still account for a significant portion of overall payments, particularly between businesses, almost all paper checks today are processed electronically.

FIGURE 3: TRENDS IN NON-CASH RETAIL PAYMENTS BY NUMBER AND TYPE OF TRANSACTION, 2000-2015

SOURCE: FEDERAL RESERVE PAYMENTS STUDY 2016²²

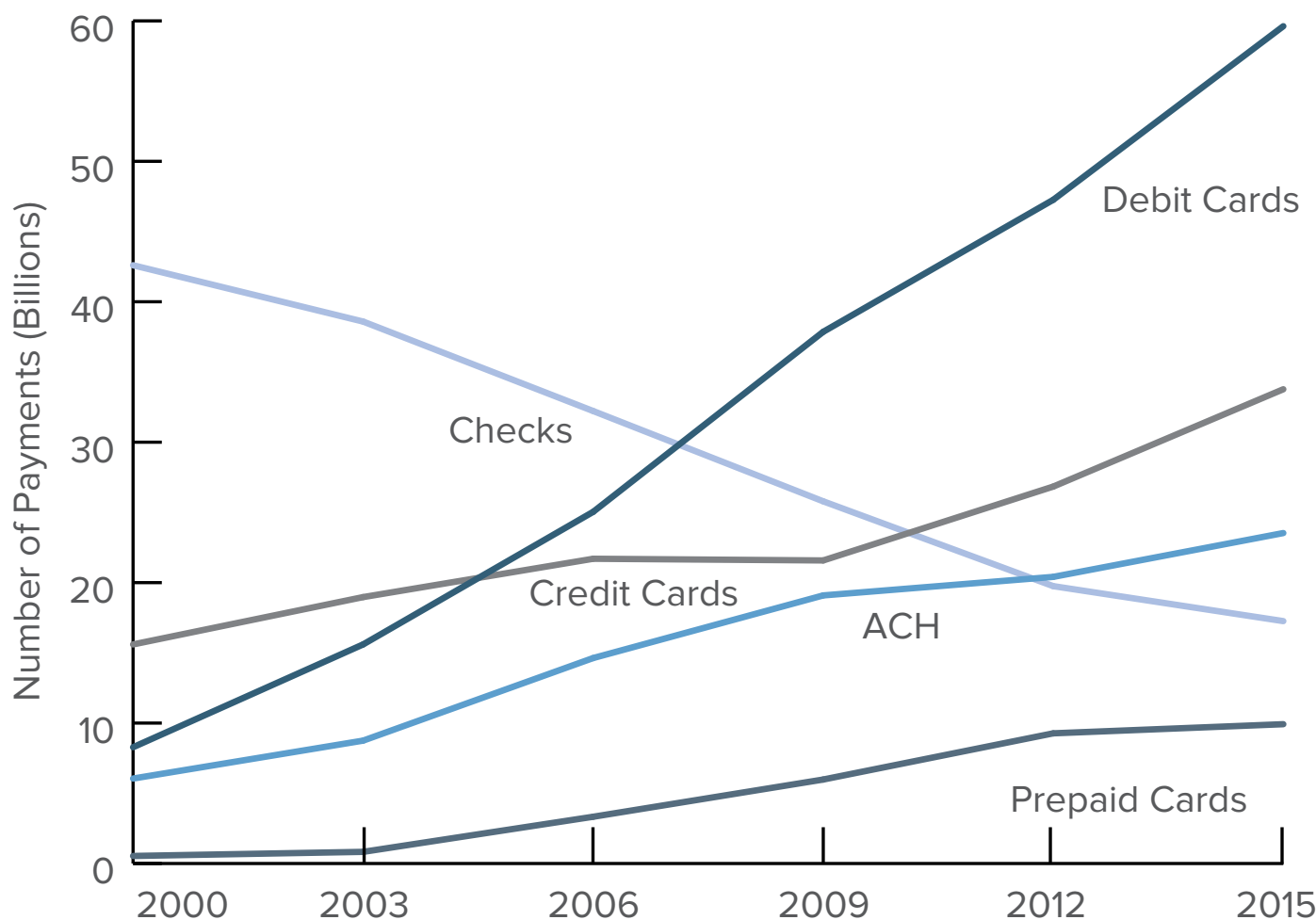


Figure 3 shows the decline in check payments and the growth in electronic payments from 2000-2015.

FIGURE 4: DISTRIBUTION OF NON-CASH RETAIL PAYMENTS IN 2015

SOURCE: FEDERAL RESERVE PAYMENTS STUDY 2016²³

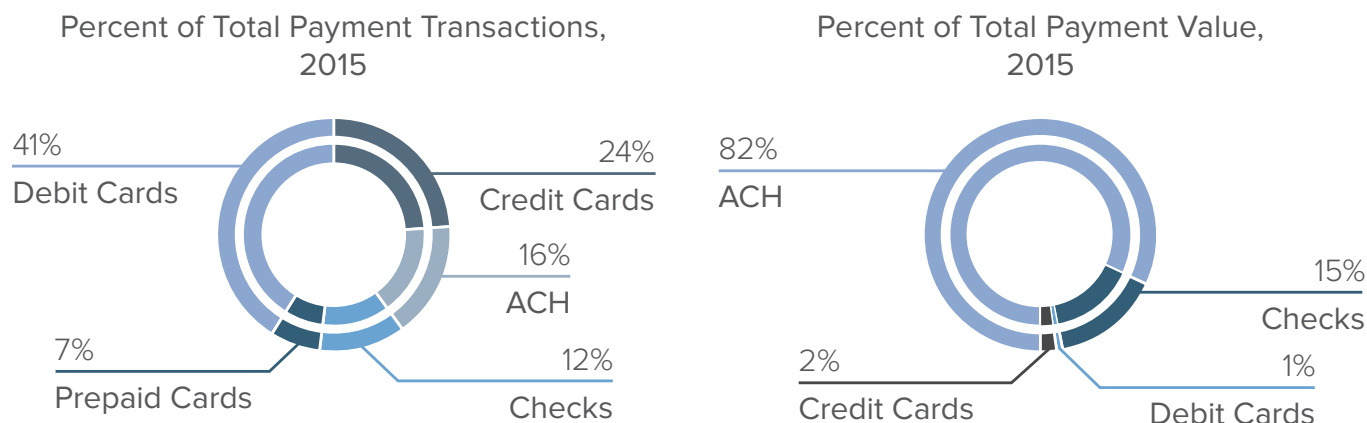


Figure 4 shows the percent of the total volume and value of non-cash retail payments in the U.S. economy made by cards, ACH, and checks. As shown, the total number of payments made by cards is greater than any other non-cash payment instrument; however, ACH payments account for the majority of value that flows through retail payment systems.

These trends can also be found in a June 2016 BAI study²⁴ that indicates consumers transact much more frequently via electronic or remote payment methods and channels (debit and credit cards, online and mobile banking) than via check payments and in-person banking interactions. This trend was particularly true for individuals aged 18 to 35 years old and is projected to continue as advanced mobile telecommunication technologies become an even more integral part of our daily lives and interactions.

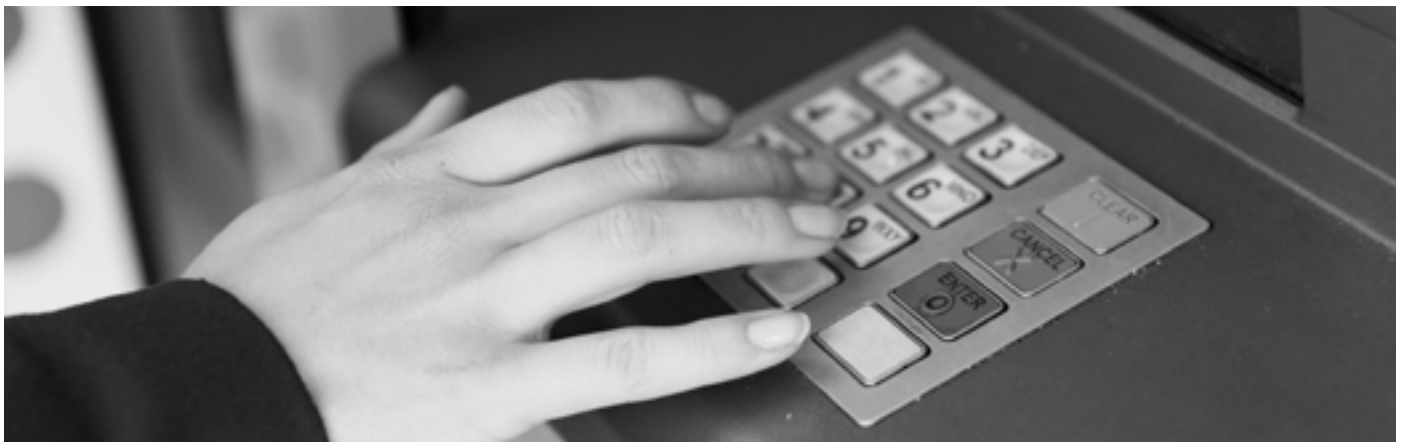
As consumers and businesses shift to electronic payment methods, technological improvements are providing new opportunities for payment providers to implement faster and more user-friendly payment capabilities. For example:

- Mobile device applications have opened up a variety of channels to interact with financial institutions and other payment providers, from managing personal finances to integrating payments seamlessly into transactions.
- APIs (application programming interfaces) are being used more frequently to connect software and web applications from multiple providers. This can allow innovative products to be easily integrated into new payment services for consumers and businesses.
- In the movement toward an “Internet of Things,” smart devices—from wristwatches to cars to refrigerators—will have the ability to initiate transactions and make payments.
- Digital currencies have the potential to change the payments landscape, particularly if adopted by one or more major central banks.
- Distributed ledger technology (e.g., blockchain²⁵) can potentially allow transactions to be verified and recorded across a distributed network of computers. This might change the roles of traditional players in payment clearing and settlement processes—for example, by eliminating the need for some types of centralized transaction bookkeeping.

Faster payments have potential synergies with these technological advances. For example, as mobile phones and other smart devices become widely used for a variety of banking and retail applications, faster payments may become more valuable to end users who wish to quickly complete transactions and manage account balances in real time using their smart devices.

To take advantage of these trends, the payment industry needs to work together to identify effective approaches and opportunities for implementing safe, ubiquitous, and faster payment capabilities in the United States.

The task force has developed the Effectiveness Criteria to identify desired attributes of a future payment system, which extend beyond the speed of payments and encompass many dimensions. Although some criteria are already met by current payments solutions, other criteria aim to address gaps. The following section highlights select task force observations, based on the current payments landscape, that explain why the areas covered by the criteria are important to consider in striving to achieve effective faster payments capabilities in the United States.



END-USER DEMAND FOR FASTER FUNDS AVAILABILITY AND UBIQUITY

As commerce increasingly shifts to online and mobile channels, end users expect to complete transactions instantly, anytime, anywhere, and expect payments to take place in real time.

In 2014, the Federal Reserve sponsored primary market research on end-user preferences for faster payment features²⁶ that found that traditional payment options do not fully meet end-user demands for speed. The study revealed that the vast majority of consumers and businesses prefer instant or one-hour payments to slower payment speeds.

According to the research, both consumers and businesses showed a desire for improved cash flow management that could result from a faster payment system. Businesses stated a strong preference for faster availability of payment funds, which reflects the notion that many businesses struggle to manage temporary liquidity and to balance cash inflows and outflows. Receiving payments quickly would decrease uncertainty and free up resources to use elsewhere. On the other

hand, consumers typically responded that faster debiting from a payer's account was more important than faster crediting to a payee, reflecting a desire to view and manage account balances more quickly and accurately. Faster payments solutions can help consumers avoid overdraft and late fees if solutions require approval of good funds and provide faster, more predictable account management.

In addition to a desire for greater speed, end users expressed a demand for payment solutions that are widely used to send payments from any account to any other account. A majority of consumers and businesses surveyed agreed that they "won't use a payment method unless it is used and accepted by most people and businesses."

The research to date indicates end-user preferences for ubiquitous faster payment methods with timely notifications; the demand for such features may increase as users rely more heavily on mobile and online commerce.

SAFETY, SECURITY, AND RISK MANAGEMENT

As electronic payment methods have been broadly adopted in recent decades, there is not only a greater demand for speed, but also for secure handling of payment data. Increasingly sophisticated cyberattacks and data breaches have reinforced the need for continued investment in payment security from all participants in the payment system. According to market research conducted by the Federal Reserve,²⁷ end users indicated a strong desire for greater privacy protections. Although most consumers and businesses are willing to write checks disclosing their account number, eighty percent of respondents said that they would prefer to share an email address or phone number rather than their bank account information.

Technologies are being implemented in the market to try to address security concerns—such as EMV²⁸ chip cards, tokenization,²⁹ encryption,³⁰ biometric authentication,³¹ and artificial intelligence.³² These technologies have the potential to more securely authenticate payment participants, improve fraud detection capabilities, and protect sensitive information throughout the payment process if providers and end users adopt them on a broad scale.

Risk management is also a critical concern for parties involved in sending and receiving payments. With some current payment methods, there is a lag between the point when a payment is authorized and when the funds are debited and credited, with finality, to the payer and payee's accounts. This leads to uncertainty in managing account balances and creates a risk that the payment could be reversed or canceled. In addition, the Federal Reserve's market research survey on end-user demand³³ indicated that over 75 percent of consumers and 84 percent of businesses stated that it is important to receive timely notification that a payment has been deducted from their account. Seventy percent of consumer payers and 82 percent of business payers indicated that it is important to receive notification when the payment is received by the payee.

Payers and payees have expressed interest in a secure payment system that moves irrevocable funds simultaneous to the processing of the payment with prompt and transparent visibility into the status of the payment.



REGULATORY ENVIRONMENT

Unlike many other countries that have implemented real-time payment systems, the United States does not have a single central authority to mandate payment standards and improvements across the industry as a whole. There are a variety of laws, rules, and regulations that govern different types of payment systems and providers and help guarantee protection to end users. Laws are passed by the U.S. Congress and state legislatures and regulations are established by federal and state agencies to implement these laws. Specific rules and agreements are also set by payment system operators, providers, and rule-making bodies.

Each payment method is governed by a different set of laws, rules, and regulations. For example, even though credit and debit card payments may seem similar to a consumer, these payment types fall under different sets of regulations and offer different consumer protections. [Appendix 4](#) lists some of the governance around payment methods and some of the major laws, rules, and regulations that apply to each type of payment.

There are several regulators charged with enforcing regulations across the payment industry. For example, different types of financial institutions are regulated by different agencies,

including the Federal Reserve, the Office of the Comptroller of the Currency (OCC), the Federal Deposit Insurance Corporation (FDIC), the National Credit Union Administration (NCUA), and state-level regulatory agencies. In addition, the Consumer Financial Protection Bureau (CFPB) was established to promote consumer protections and enforce federal consumer financial laws across the financial industry for non-bank providers and large depository institutions. The Federal Trade Commission (FTC) protects consumers from unfair and deceptive acts and practices and enforces consumer protection regulations for most non-bank financial entities across the nation.

Non-bank providers typically do not offer the same range of products and services as financial institutions and may not be subject to the same types of regulation; however, depending on the types of payment services they provide, non-banks are required to meet various laws, rules, and money transmission licensing requirements in each of the 50 states.

Regulators and industry players jointly benefit from collaboration and discussion to promote consistent understanding of market changes and the legal and regulatory structure.



ELECTRONIC PAYMENT MESSAGING STANDARDS

For an electronic payment to take place, messages have to be sent between financial institutions and other providers involved in the transaction to identify the payer and payee's account information, the payment amount, and other transaction details. Payment messages include standard identifiers and syntax so that the information can be read and processed correctly by all parties.

Payment transactions today do not always facilitate sending sufficient types of data directly with the payment, such as biller reconciliation information, information to facilitate investigations of possible fraud or error, loyalty/rewards information, or other types of messages.³⁴

A variety of messaging standards are used around the world. Many countries have fixed character limits that do not permit detailed data to be transmitted with payments. In the United States, ACH payments provide the ability to send large amounts of data with certain types of payments; however, this capability is not available for all electronic payments. There is no broadly adopted standard across the industry.

ISO 20022³⁵ is the international standard for XML-based payments and provides the ability to transmit detailed payment data in a standardized format. Several countries that have adopted faster payment systems have also adopted ISO 20022 messaging standards with approximately 200 global initiatives currently completed or underway to adopt ISO 20022 across a variety of business uses.³⁶

In addition to electronic payment messages, e-invoicing capabilities allow businesses to send and receive invoices corresponding to electronic payments. Most businesses have not yet adopted e-invoicing solutions for a variety of reasons such as lack of IT resources, lack of common standards or software, and dependence on practices of business partners.³⁷ Many businesses rely on check payments because they are unable to send or receive detailed payment data in a standard way and reconcile payments and invoices electronically.



CROSS-BORDER PAYMENTS

Today, cross-border payments typically take much longer to process than domestic payments and carry much higher transaction fees. A payment often goes through a complex network of international and intermediary banks (each charging a fee) before it reaches the final recipient. This makes it difficult for businesses to transact across national borders and for consumers to send and receive remittance payments³⁸ conveniently and cost-effectively.

Several innovative companies are developing new services to help bridge this gap, but they face

many challenges in trying to operate on a global scale and typically focus on limited markets or use cases. Global industry groups have formed to collaborate on developing technical frameworks and providing market practice guidance for faster cross-border payments, including the ISO Real-Time Payments Group and the International Payments Framework Association (IPFA).³⁹ These groups intend to influence the extent to which global interoperability is built into system design, which may affect the efficiency of that system over time in processing cross-border transactions.



GLOBAL IMPLEMENTATIONS OF FASTER PAYMENTS

While the United States payments infrastructure and economy differ from other countries, insights on faster payment system design from various international implementations can provide considerable value for providers and end users. Over a dozen countries have implemented faster payments solutions with several others in development and early planning stages.⁴⁰ Each system was built with features that address the country's market composition and end-user needs. Many of these systems have continued to evolve over time, offering new products to meet market demands.

GOVERNMENT INVOLVEMENT IN FASTER PAYMENTS

In most countries where faster payments have been implemented, the payment industry was initially driven to implement a faster payment system as a result of a government mandate or regulation. In some countries, central banks also own and operate the faster payment system (e.g., Mexico, Iceland, and Turkey). In other

Most countries that have implemented faster payments were able to establish a solution that allows providers to build on top of a single platform. Because of the breadth and complexity of the U.S. market, a single faster payment platform in the United States may not be a likely outcome. However, experiences in other countries can shed light on approaches for faster payment models and implementations. Table 3 lists several faster payments implementations around the world that offer a range of characteristics.⁴¹

countries, private operators—often owned by major banks—provide faster payment services (e.g., UK, Sweden, Japan, and Australia). Even in countries where private operators provide authorization and clearing services for faster payments, settlement services are typically provided by the central bank.

SPEED AND HOURS OF OPERATION

Almost all global faster payment systems are able to clear payments within seconds. Typically, the funds are made available to end users within a minute after the payment is initiated. Some systems may provide a payment confirmation within seconds, but allow banks to delay posting the funds to end-user accounts for a few minutes to a few hours.

Settlement speed also varies by country. Although most retail faster payment systems have been designed to settle on a deferred net basis at the end of the day or multiple times throughout the day, some settle payments in real time.⁴² For example, the UK's faster payments system settles three

times per day on a deferred net basis. It also uses prefunding as a risk mitigation measure. By contrast, other payment systems (e.g., Australia, Mexico, Switzerland, Japan) either choose to settle all payments in real time or use real-time settlement for high-value payments and deferred settlement for low-value payments.

Hours of operation also vary from country to country. Many faster payment systems operate on a 24x7 basis, although some do not guarantee immediate processing outside of certain hours or business days (e.g., Mexico, Brazil, and Japan). Hours of availability for end users may also vary by provider.

TYPES OF PAYMENT SERVICES PROVIDED:

Most countries have initially focused on providing faster person-to-person payments and/or business-to-business payments.⁴³ Since these types of payments are frequently made by checks or cash today, faster payment options provide opportunities for greater payment efficiency and enhanced data capabilities.

There are a variety of methods available for initiating faster payments. Many countries allow faster payments to be made through internet banking portals or bill payment systems. The use of mobile payments is growing, and faster payments initiated through mobile devices are becoming popular in several countries (e.g., UK, Sweden, Singapore, and India).

TABLE 3: GLOBAL FASTER PAYMENT SYSTEMS

SOURCE: FIS FLAVORS OF FAST 2016

COUNTRY	FASTER PAYMENT SYSTEM	YEAR OF IMPLEMENTATION
Japan	Zengin System	1973
Switzerland	Swiss Interbank Clearing—SIC	1987
Iceland	Greiðsluveitan ⁴⁴	2000
South Korea	Interbank Home/Firm Banking Network—HOFINET	2001
Brazil	Funds Transfer System—SITRAF	2002
Mexico	Sistema de Pagos Electronicos Interbancarios—SPEI	2004
South Africa	Real-Time Clearing—RTC	2006
Chile	Transferencias en Linea—TEF	2008
United Kingdom	UK Faster Payments	2008
China	Internet Banking Payment System—IBPS	2010
India	Immediate Payment Service—IMPS	2010
Nigeria	NIBSS Instant Payments—NIP	2011
Poland	Express ELIXIR	2012
Sweden	Payments in Real-Time—BIR	2012
Turkey	Retail Payment System—RPS	2012
Sri Lanka	Lanka Pay	2013
Denmark	NETS Real-Time 24/7	2014
Singapore	Fast and Secure Transfers—FAST	2014
Bahrain	Fawri +	2015
Australia	New Payments Platform—NPP	Expected 2017

Lessons learned from implementations of faster payments in other countries may help in the design and rollout of faster payments in the United States. For example, by designing the core faster payments infrastructure in a flexible way, providers can create value-added services on top of a new faster payment platform (e.g., mobile payment applications or bill payment services), giving them opportunity to generate revenue from the new service.

Many countries that originally built a faster payment system using domestic messaging standards with limited ability to transmit detailed payment data and/or limited cross-border interoperability have since decided to transition to more flexible messaging standards.⁴⁵ Some countries that have implemented faster payments in recent years (e.g., Denmark, Singapore, and Sweden) have adopted ISO 20022 messaging standards from the beginning to avoid having to transition to internationally interoperable messaging standards at a later date.

Although most international faster payment systems are relatively new, end-user adoption is growing in many markets and innovative new products and services have begun to emerge. For example, in 2015, the number of faster payments in the United Kingdom grew by 13%, compared

to a 4% growth in Bacs, the UK's ACH equivalent.⁴⁶ Innovation may expand beyond the financial industry to impact the broader economy. In the UK, faster payments “enabled retailers to shift to a just-in-time product delivery model, reducing the need for working capital.”⁴⁷ Other countries have designed new payment systems with improved data and e-invoicing capabilities in mind, allowing businesses to streamline their accounting systems and automate business processes.⁴⁸ While faster payments itself does not improve features such as data and e-invoicing, the creation of a new payment system may provide opportunities to make enhancements to these types of capabilities.

In addition to the growing number of national-level faster payment systems operating around the world, there is also a movement toward greater cross-border interoperability between systems. For example, the European Payments Council has announced its intention to expand the Single Euro Payments Area (SEPA) integration to enable faster payments between European countries.⁴⁹

As the task force continues to consider effective approaches for solutions in the United States, lessons from these global implementations will support analysis and recommendations to follow later in Part Two of the final report.



BROAD BENEFITS OF SAFE, UBIQUITOUS FASTER PAYMENTS

While there are always costs and risks involved in implementing new technology, faster payments solutions with broad reach and strong safety standards in place could lead to many benefits for society as a whole.

The Federal Reserve commissioned a study in 2014 to identify which types of domestic payments had unmet needs for speed. The study found that at least 29 billion transactions, or 12 percent of all U.S. payments annually, could benefit from faster authorization, clearing, settlement and/or availability of funds.⁵⁰ The specific use cases that could benefit most from faster payments include:

- Person-to-person payments, such as paying a friend or a babysitter;

- Certain types of person-to-business payments, such as emergency bill payments or rent payments;
- Certain types of business-to-person payments, such as wage payments for temporary workers or medical insurance claim payments; and
- Certain types of business-to-business payments, such as just-in-time supplier payments.

A fast, safe, ubiquitous payment system could benefit society in the long run by improving payment system efficiency, providing a safe framework for payments, and promoting global competitiveness and interoperability.

SPEED AND AVAILABILITY

As consumers and businesses are able to send and receive payments more quickly, this may allow easier cash flow management and more predictable budgeting, spending, and investing. Fast good funds verification could reduce the chance for end users to make unintentional overdrafts and help them avoid costly short-term financing. If faster payment solutions are designed to process payments on a 24x7 basis,

end users may benefit from the additional flexibility to quickly complete transactions and monitor accounts at any time. In addition, if faster payments solutions are able to take the place of checks, small businesses and underbanked consumers may be able to receive funds more quickly. Over time, business models and processes could change dramatically based on faster funds availability.

PAYMENT SYSTEM EFFICIENCY

Society as a whole could benefit from greater payment system efficiency if fast, ubiquitous electronic payments solutions decrease the cost of operating and maintaining the infrastructure needed for paper-based payments. Studies from the UK, Singapore, and Mexico show that faster payments adoption has not caused a noticeable reduction in debit card transactions, but has

likely reduced the use of less efficient payment methods such as checks and cash.⁵¹ Several countries have seen a growth in electronic payment volumes and a reduction in bank branch visits after implementing faster payment systems.⁵² If the United States follows a similar trajectory, faster payments could facilitate cost savings to society in the long run.⁵³

RISK MANAGEMENT, SAFETY, AND SECURITY

Faster payments could help reduce many of the risks in the current system by shortening the delay between payment initiation, clearing and settlement. Timely confirmation of good funds and certainty of payment finality could benefit both financial institutions and their customers.

While faster payments solutions will introduce new risks, such as operational risks associated with more rigorous processing requirements, there are also broad benefits to be gained if new solutions meet high standards of risk management, safety, and security. When building a new payment system and/or integrating faster payments with existing systems, there

are opportunities to include stringent risk management, safety, and security standards even though these standards may not be directly linked to payment speed. For example, most other countries that have implemented faster payments have focused on credit-push payment models (where the payer initiates a payment to the recipient, rather than the recipient requesting funds from the payer's account).⁵⁴ By requiring the payer to authenticate each transaction, a faster payment system could reduce fraud. If faster payments solutions incorporate advanced security features and technologies into their design, this may lead to greater public confidence in the payment system in the long run.

GLOBAL COMPETITIVENESS AND INTEROPERABILITY

A potential benefit of faster payments may be greater global competitiveness and the long-run possibility for faster and easier global transactions. For businesses operating in multiple countries, banks making payments

across borders, or consumers sending money abroad, faster payments solutions with globally interoperable standards could eventually help to facilitate faster, more transparent and affordable cross-border payments.



BENEFITS FOR PROVIDERS AND END USERS OF FASTER PAYMENTS

As with any major shift in technology, payment providers will face both costs and benefits to upgrade their systems to a new faster payments infrastructure. Investment by providers and adoption by end users will depend on the specific benefits they can gain from faster payments. Each stakeholder involved in making and receiving payments will face unique costs and benefits in shifting to a faster payment system.

Financial institutions of any size may face substantial costs in upgrading their systems to safely and securely process, post, clear, and settle transactions more quickly, particularly if the system rules require 24x7 availability. These costs will likely be front-loaded in the first few years of shifting to a new system.

Small and medium financial institutions in particular may worry about gaining affordable access to a new system and providing an acceptable level of service for their customers. Requirements may vary based on their existing service providers and back-end systems. However, faster payments solutions from industry service providers should help to level the playing field for small and medium financial institutions by providing them with a way to offer faster payment services to their customers at a reasonable cost and risk.

Although there may be risks with early adoption of new payments solutions, there are potential opportunities in providing cutting-edge payment services. Long-term benefits include maintaining a strong customer relationship and remaining highly relevant through the ability to offer innovative new products in the face of increasing competition.

Non-bank providers include a wide variety of firms involved in some aspect of payment processing—from large financial service providers to small technology firms. Non-bank providers have the ability to develop new and innovative financial products quickly, and faster payments may provide many opportunities to enhance existing products and offer new services. Non-bank providers may develop full end-to-end faster payments solutions or help to implement one or more pieces of new solutions. Providers may face significant costs in developing or upgrading payment solutions and diverting scarce resources from other initiatives; however, there are potential payoffs to transitioning to a faster payment environment, such as the ability to develop products and solutions designed for market segments which are currently underserved.



Business end users have expressed a strong desire to receive payments more quickly. Faster receipt of funds may help both large and small businesses to manage cash flows in real time and avoid expensive short-term financing. For example, faster availability of funds may help freelance or contract workers better manage certain liquidity concerns. Businesses will also benefit from greater certainty as payments clear and settle more quickly with finality. In addition, faster payments could lead to innovative practices or services that might allow for differentiation among competitors. For example, innovations may facilitate biller-initiated requests for payment or better customer service for rebates and refunds. Some companies may face a high cost to upgrade their current payment and accounting systems to accommodate real-time transactions and take

Government agencies may also face costs in upgrading their back-end systems and processes to receive and send real-time payments, but large volumes of government payments could be processed more quickly with transparent and timely notifications. In particular, emergency and disaster payments would greatly benefit from immediate processing.

Consumers could benefit from particular uses that are not well-served by current payment options—for example, just-in-time bill payments or ubiquitous person-to-person payment methods that do not require both the payer and recipient to set up an account with a particular provider before sending a payment.

Faster payments could promote greater financial inclusion if new solutions are able to reach customers of non-bank providers that are not



advantage of these benefits. But if businesses decide to pursue faster payment options, there may be opportunities to jointly upgrade other payment processes as well, such as enhancing payment data capabilities for more efficient reconciliation of payments.

Smaller businesses that do not currently use electronic payments could also potentially benefit by shifting directly from paper checks to real-time payments. This would be similar to the experience of some financial institutions and businesses that skipped PC-based workstations when implementing internet-based services. Small businesses using desktop or online accounting applications, or third party service providers, may more easily shift to faster payments if those services incorporate faster payments capabilities.

well served by mainstream payment options today.⁵⁵ Unbanked and underbanked⁵⁶ consumers might particularly benefit from faster, safe payment products with features such as faster access to funds and timely payment notification to facilitate easier cash-flow management.

Consumers would also benefit from receiving payments such as insurance claims or temporary wages more quickly. In addition, faster receipt of payments and easier real-time money management could help consumers avoid penalties such as late fees, check-cashing fees,⁵⁷ and overdraft fees.⁵⁸ At the same time, development of faster payment capabilities would provide an opportunity to address a range of fraud protection issues that either exist today or would result specifically from faster payments.

CONCLUSION

The U.S. market has already begun to move toward faster payments capabilities and this trend is continuing to gain momentum. Other countries have made significant strides toward payment modernization and the technology exists in the U.S. market to deliver faster payments solutions. Coordinated action from payment industry stakeholders can help prevent further fragmentation of the market, promote greater interoperability, and create an environment for new innovations to be rolled out to a broad base of end users safely and efficiently.

While current payment methods have evolved over time to meet a variety of end-user needs in a complex economic environment, today's payment systems were not individually designed to satisfy the range of end-user needs identified in the Faster Payments Effectiveness Criteria.

Ubiquitous faster payments capabilities with strong safety standards may meet a broad range of end-user needs, promote greater innovation and efficiency, improve the flow of commerce, and position the U.S. market for greater long-term competitiveness in the global financial system. Faster payments will better meet the evolving expectations of consumers and

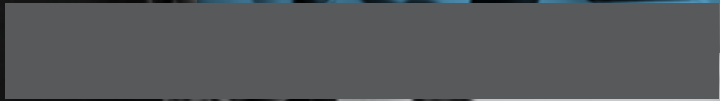
businesses for instant transactions and information. The Faster Payments Task Force is leading a unique, market-driven initiative, bringing together stakeholders from across the payment industry to envision how to progress toward safe, ubiquitous faster payments in the United States. The task force has worked to identify criteria for effective faster payments solutions, solicited innovative proposals for achieving those goals, established an approach for assessing solution proposals, and continues to support industry collaboration to further the prospect of payments evolution.

In mid-2017, Part Two of the final report will provide details of faster payments solutions that have been evaluated against the Effectiveness Criteria by a Qualified Independent Assessment Team. In addition, the task force will analyze the challenges and opportunities that remain as industry players move forward to implement these solutions in the marketplace. Based on this analysis, the task force will provide recommendations and next steps for the industry to seize the opportunity for realizing a faster, safe, and more convenient payment system.





APPENDICES



APPENDIX 1: FASTER PAYMENTS TASK FORCE PARTICIPANT ROSTER

TABLE A: FASTER PAYMENTS TASK FORCE PARTICIPANTS

(Steering Committee members denoted with an asterisk)

NAME	ORGANIZATION
* Roy DeCicco	Accredited Standards Committee (ASC X9)
* Bob Steen	Bridge Community Bank
* Gary Stein	Consumer Financial Protection Bureau
* Christina Tetreault	Consumers Union
* Jordan Lampe	Dwolla, Inc.
* James Reuter	FirstBank Colorado
* Gary Beets	Fiscal Service, Department of the Treasury
* Kathy Hanna	Kroger
* Marceline White	Maryland Consumer Rights Coalition
* Janet Estep	NACHA—The Electronic Payments Association
* Ryan Zagone	Ripple
* Wanda Chambers	Suncoast Credit Union
* Mark Keeling	The Bankers Bank
* Steve Ledford	The Clearing House (TCH)
* Thomas Rea	U.S. Bank
* John Drechny	Wal-Mart Stores, Inc.
* Mitch Christensen	Wells Fargo & Company
* Bradley Wilkes	WingCash LLC
Paul Laska	A.N. Deringer, Inc.
David Grindal	ACI Worldwide
Yervant Manavian	ADP LLC
Will Montis	AgriBank, FCB
George Rudolph	Alliant Credit Union
Michelle McDowell	Alloya Corporate Federal Credit Union
Michael Baker	Alpine Bank
Stephen Kenneally	American Bankers Association
Karen Czack	American Express
Roy Olsen	American National Bank & Trust
Randall Gutierrez	Anza International

TABLE A: FASTER PAYMENTS TASK FORCE PARTICIPANTS (CONTINUED)

NAME	ORGANIZATION
Eric Dotson	Aptys Solutions
Sandra Beeker	Army GFEBS (General Fund Enterprise Business System)
Dan Caputo	Ascendantfx Capital Inc
Magnus Carlsson	Association for Financial Professionals (AFP)
Carl Weir	Aten Group LTD
Janet Boyst	Atlantic Capital Bank
David Tente	ATM Industry Association—ATMIA
Patrick DeVilbiss	BAFT (Bankers Association for Finance and Trade)
James Grady	BAI
Kelly Burdette	Bank Independent
Adam Anderson	Bank of Commerce
Barbara Gross	Bankers' Bank
Candice Jackson	Bankers' Bank of Kansas
Debbie Wendt	Bankers' Bank of the West
Matt Ribbens	BB&T
Bob Hays	BBVA Compass
Polly Thorsness	Bell State Bank & Trust
Lee Weiss	Berns Weiss LLP
Stephen Mott	BetterBuyDesign
Breffni McGuire	BMCG Consulting
Florence Johnson	BMO Harris, N.A.
Christopher Mager	BNY Mellon
Ken Myhra	Boeing Employees Credit Union (BECU)
Alenka Grealish	Boston Consulting Group
Jessica Cheney	Bottomline Technologies
Randi Potter	Busey Bank
Jim Fancher	C2C Consulting LLC
James Methé	Capgemini Financial Services USA Inc
Karl Dicker	Capital One N.A.
Tamara Vande Velde	Capitol Federal Savings Bank
Thomas Davis	Card Services for Credit Unions, Inc.
Brad Ganey	Catalyst Corporate Federal Credit Union
Suchitra Padmanabhan	CB Bancshares Corp. (WEIR)
Ali Raza	CCG Catalyst Consulting Group
Eric Purdum	CeleritifinTech Services
Rebecca Borne	Center for Responsible Lending
Brooke Toward	CGI
John Beccia	Circle Internet Financial

TABLE A: FASTER PAYMENTS TASK FORCE PARTICIPANTS (CONTINUED)

NAME	ORGANIZATION
Radha Suvarna	Citi
Stephen Devine	Citizens Financial Group
Elena Whisler	Clear2Pay
Christienne Genaro	CM Genaro LLC
Mark Frank	CoBiz Bank
Ian Schweid	Coconut Grove Bank
Edward Herman	Cognizant Technology Solutions
Susan Doyle	Commerce Bank
Barbara Clark	Commercial Law Institute
Marc Armstrong	Commonomics USA
Greg Aumann	Computer Services Inc
Gray Taylor	Conexus & NACS
Steve Forston	CONIX Systems, Inc.
Dong Hong	Consumer Bankers Association
Jim Hanisch	CO-OP Financial Services
Charles Harkness	Corporate One Federal Credit Union
Rue Jenkins	Costco Wholesale Corporation
Luke Martone	Credit Union National Association (CUNA)
Gene Neyer	D+H Global Transaction Banking Solutions
Paul Tomasofsky	Debit Network Alliance
Angela Angelovska-Wilson	Digital Asset Holdings LLC
Sarah Martin	Digital Currency Council
Miguel Martinez	Dirigendo Ltd.
Judith McGuire	Discover Financial Services
John MacAllister	Dorado Industries, Inc.
Namratha Monteiro	Dovetail
Erin Fonte	Dykema Cox Smith
Marie Davis	Eagle Bank
Laura Weinflash	Early Warning
Barbara Heinemann	Eastern Bank
Norman Robinson	EastPay
David Walker	ECCHO
Peter Ehmke	Edgar Dunn & Company
Kurt Helwig	Electronic Funds Transfer Association
Scott Talbott	Electronic Transactions Association (ETA)
Marilynn Davis	Ent Credit Union
Ann-Marie Bartels	EPCOR

TABLE A: FASTER PAYMENTS TASK FORCE PARTICIPANTS (CONTINUED)

NAME	ORGANIZATION
Joan Krempa	ESL Federal Credit Union
Misti Mostiller	Extraco Banks, N.A.
Robbie Jones	F&M Bank
Ronald Cekovich	F&M Trust
Deborah Shaw	Federal Deposit Insurance Corporation (FDIC)
Theresa Mahoney	Federal Home Loan Bank of Boston
Jeff Siekman	Fifth Third Bank
Brian Peters	Financial Innovation Now
Jason Kratovil	Financial Services Roundtable
Bill Waller	First Bank & Trust
Stephanie Parks	First Data Corporation
Thomas Graham	First Fidelity Bank, NA
Brandy Wheeler	First National Bankers Bank
Matthew Growden	First United Bank & Trust
Robert Woodbury	FIS
Sriram Iyer	Fiserv
James Valdez	Frost Bank
Carole Reynolds	FTC Bureau of Consumer Protection
James Angel	Georgetown University
Michael Sklow	Goldman Sachs
Lewis Goodwin	Green Dot
James OConnor	GreenBack
Leroy Greene II	Greenlads Payment Services, LLC
Lanny Byers	Guerdon Solutions
George Warfel	Haddon Hill Group Inc
Kevin Kern	Harland Clarke
Michael Coltharp	Home Loan State Bank
Sidney "Chip" Corbett	Hoyne Savings Bank
James Santangelo	HSBC Bank USA, N.A.
Stan Stalnaker	Hub Culture Services Ltd.
Alok Mathur	Hughes Network Systems, LLC
Barry Tooker	IBM
Tina Giorgio	ICBA Bankcard and TCM Bank
Tom Hays	Icon Solutions LTD
Karthik Sivaprakasam	I-Exceed Technology Solutions Inc.
Tom Gihl	Illinois National Bank
Cary Whaley	Independent Community Bankers America (ICBA)
Sarah Jane Hughes	Indiana University

TABLE A: FASTER PAYMENTS TASK FORCE PARTICIPANTS (CONTINUED)

NAME	ORGANIZATION
Michael Barr	Individual Participant
Yobie Benjamin	Individual Participant
Steven Bohn	Individual Participant
Gregory Boudreaux	Individual Participant
Darren Elcock	Individual Participant
Donna Embry	Individual Participant
Frazier Evans	Individual Participant
Scott Forston	Individual Participant
Freda Hadnot	Individual Participant
Michael Herbert	Individual Participant
Anita Patterson	Individual Participant
Ian Rubin	Individual Participant
Eileen Schwed	Individual Participant
Oliver Manahan	Infineon Technologies
Vijay Anand	Infosys Limited
Dickson Chu	Ingo Money, Inc.
Ryan Schneider	Integrity Payment Systems
Ganesh Guruvayer	Intellect Design Arena Limited
Scott Volmar	InterComputer Corporation
Eva Williams	Internal Revenue Service
Al DeBonnett	International CyberBanque, Ltd.
Michael DeBroeck	INTRUST Bank, N.A.
Kirsten Trusko	IRC Advisory
Tom Bianco	J P Morgan
Deborah Phillips	Jack Henry
Richard Leirer	Jaguar Software
Alun Thomas	Kalypton Group LTD
Brian Guess	KeyBank
Eric Nelson	keyPoint Credit Union
Rich Stuppy	Kount Inc.
Chris Hadorn	KPMG LLP
Tim Vosberg	Lake City Bank
Cheryl Yavornitzki	LendingTools.com, Inc.
Beatriz Saldivar	Lets Talk Treasury
Greg Lloyd	Level LLC
Leo Lipis	Lipis Advisors
Joseph Mason	Louisiana State University and the Wharton School
Rachel Wasko	LYFT Inc

TABLE A: FASTER PAYMENTS TASK FORCE PARTICIPANTS (CONTINUED)

NAME	ORGANIZATION
Jeanine Andol-Moeller	M&T Bank
James Neill	Macon-Atlanta State Bank
Brian Stout	Macys
Roger Applewhite	Magensa, LLC
Mark Ericksen	Mantrana Partners
Pamela Rabaino	MasterCard
Randolph Kantorowicz	m-banco
Patricia Hui	Mentor Graphics Corporation
Mark Horwedel	Merchant Advisory Group (MAG)
Nicole Dilts	Michigan State University Federal Credit Union
Robert Dael	Mid-Atlantic Clearing House Association (MACHA)
Sheila Noll	Midwest Independent Bank
Edward Woods	Mindful Insights, LLC
Sam Dzirasa	Mirac Systems, Inc.
Christopher Nehrbauer	MLK Technology Consulting, LLC.
Daniel Csoka	Mobile Money Matters
James Jefferson	Montecito Bank & Trust
Olga Zeltser	Morgan Stanley
Livia Judith Szabo Klimovitsky	Moshulu Group Inc.
Jad Chahine	Moulah Inc.
Hugh Enobakhare	Mroute Corp
Russell Ellsworth	MUFG Union Bank, N.A.
Edward Starrs	MyECheck
Marcus Andrade	NAC Foundation LLC
Laurence Cooke	nanoPay inc.
Pamela Kroeger	NASA—National Aeronautics Space Administration
Carrie Hunt	National Association of Federal Credit Unions
Lauren Saunders	National Consumer Law Center
Timothy Dwyer	Nationwide Insurance
Tynika Wilson	Navy Federal Credit Union
Steve Nogalo	NCR Corporation
Joseph Casali	NEACH
Josh Karoly	Netflix
Alain Espinoza	Nielsen
Michael Bilski	North American Banking Company
Manfred Neustifter	NowKash Inc.
Gail Simpson	Office of the Comptroller of the Currency

TABLE A: FASTER PAYMENTS TASK FORCE PARTICIPANTS (CONTINUED)

NAME	ORGANIZATION
Grant Colhoun	Okanii Inc.
John Kamin	Old National Bank
Tony Hayes	Oliver Wyman
David Jackson	Oracle
Allen Sztukowski	Pacific Coast Bankers' Bank
Paul Proctor	ParityPay, Inc.
Mary Ann Callahan	Paxos Trust Company, LLC
Rebecca Wagner	Paychex, Inc.
Max Narro	PayCommerce
Gary Lewis Evans	Paymency Inc.
Richard O'Brien	Payment Pathways, Inc.
Bradley Pragnell	Payments Canada
Deborah Baxley	Payments Transformation & Innovation Consulting
Peggy Gachesa	PaymentsFirst
Fran Duggan	Payveris
Paul Trozzo	PNC Bank
Kenneth Oros	POStive Resources
Randy Templeton	PreCash
Tim O'Donnell	Price Waterhouse Copper, LLC. (PWC)
Art Harper	PSCU Financial Services
Larry Cohen	Q R Special Payments
Debbie Smart	Q2E Banking
Bryan Scott	Quail Creek Bank
Eric Dunn	Quicken, Inc.
Mary Ellen Brown	RBC Royal Bank
Rodman Reef	Reef Karson Consulting, LLC
Kevin Leitten	Regions Bank
Adam Rust	Reinvestment Partners
Jose Cortedano	Rosetta Technologies
Vuk Bulajic	Safe Cash
Steven Page	SafeAmerica Credit Union
Andrew Durket	Saint Louis County Government
Sabeh Samaha	Samaha & Associates, Inc.
Julieta Abad	San Mateo Credit Union
Peter Gordon	Santander Bank
Cheryl Collier	SEFCU
Kevin Christensen	SHAZAM Network
Geng (Eric) Zhou	Shoptaki

TABLE A: FASTER PAYMENTS TASK FORCE PARTICIPANTS (CONTINUED)

NAME	ORGANIZATION
Stephen Trusheim	SignalFire
Kathi Moore	Social Security Administration
Donald Jackson	Southern Financial Exchange
Charles Wallen	Spectrum
Ranay Allred	Star One Credit Union
Tanya Strawn	Starbucks
Alisa Rosenberg	Starwood Hotels and Resorts
Joseph Caputo	State Street Bank and Trust
Mark Hargrave	Stinson Leonard Street LLP
Jennifer Lucas	Suntrust Bank
Booshan Rengachari	SwapsTech Inc.
Ignacio Blanco	SWIFT Pan-Americas, Inc.
Sankaet Pathak	Synapse Payments LLC
Wade Murray	Synechron
David Crane	T G and C Group
Jeff VanMeter	Target Corporation
Brenda Sorenson	TASCET
Regina Williams Hendrick	Tata Consultancy Services
Richard Burke	TD Bank, NA
Barbara Hvasta	Telogis, Inc.
Randall Chapoman	Texas Legal Services Center
Andrew King	The Bancorp
Dan Fisher	The Copper River Group
Tammy Plummer	The First National Bank
Selina Horton	The Northern Trust Company
Rachel Siegel	The Pew Charitable Trusts
Jean Roesch	The PrivateBank and Trust
Lawrence Temlock	The Sun Exchange
Badr Qureshi	Think Finance
Edward Oppenheimer	Thought Matrix Consulting
Andreas Baumhof	ThreatMetrix, Inc
Jon Sarvis	TMG Financial Services
Marten Nelson	Token
Lakshan Fernando	Toyota Motor Credit Corporation
Dave Robertson	Treasury Strategies, Inc.
Sarah Hartman	TSYS
Triston Thompson	UMB Bank NA
Bill Thomas	United Nations Federal Credit Union

TABLE A: FASTER PAYMENTS TASK FORCE PARTICIPANTS (CONTINUED)

NAME	ORGANIZATION
Stephen Ranzini	University Bank
Catherine Wilson	University of Nebraska-Lincoln
Fred Laing	Upper Midwest Automated Clearing House (UMACHA)
Glen Fossella	Urban FT, Inc.
Leilani Doyle	US Dataworks
Matt Doddato	USAA
Jon Genovese	Vantiv Inc.
David Ezell	VeriFone
Charles Ellert	Verizon
Frank Visintin	Virtual Process Design LLC
Saurabh Chopra	VISA Inc.
Jim Mortimer	VocaLink
Douglas Green	Volante Technologies Inc.
Charlie Brinza	Vsoft Corporation
Larry Buettner	Wausau Financial Systems
William Schoch	WesPay
John Connelly	Whitney Bank
Travis Dulaney	Wildcard Payments
Mary Ann Francis	Wipro Ltd.
Mary Gilmeister	Wisconsin Automated Clearing House Association (WACHA)
Andrew Paur	Woodforest National Bank
Theodora Rand	Woodstock Institute
Michael Ruccolo	World Currency USA
Michael Ward	WorldFirst
Darrick Weeks	Wright Patt Credit Union
Joseph Potvin	Xalgorithms Foundation
Donald Barry	Zions Bancorporation

APPENDIX 2: CAPABILITY SHOWCASE

Table B provides details on Faster Payments Capability Showcase providers. Additional submissions may be found at [FedPaymentsImprovement.org](https://www.fedpaymentsimprovement.org).

The capability showcase providers were encouraged to submit descriptions and short videos highlighting capabilities that may

support end-to-end faster payments solution proposals. Please note that the showcase descriptions were provided by each company that submitted a capability to the showcase. These descriptions are not endorsed by anyone other than the company listed.

TABLE B: CAPABILITY SHOWCASE SUBMISSIONS

CAPABILITY NAME	COMPANY	SHOWCASE DESCRIPTION
<u>An Internet of Rules</u>	Xalgorithms Foundation	Through the generic API of any commerce, payment or forms solution, on any platform, Xalgorithms components are designed to supply an auxiliary service at the decisive pre-payment point in a transaction that gives buyers and sellers greater knowledge and control of rules that apply, enabling them to more fully assert their legal prerogatives in controlling various direct and indirect transaction costs. They become able to: determine which payment method affords the lowest transaction cost; invoke context-sensitive loyalty programs; stabilize value through algorithmic pricing; get notified of tax and cross-border duties, credits and exemptions; automate government subsidies; etc.
<u>CGI All Payments</u>	CGI	CGI All Payments is a market-leading payment system that addresses all payment processing needs, whether focused on retail or wholesale. High-volume, high-care and real-time services allow you to meet market and customer demands on a prioritized basis while working towards your payments vision. Within a single deployment, multi-entity capabilities enable users to establish dedicated process flows and service levels for separate geographies, lines of business, groups or even individual customers. And business owners can determine the mapping of payment types to a payment service.

TABLE B: CAPABILITY SHOWCASE SUBMISSIONS (CONTINUED)

CAPABILITY NAME	COMPANY	SHOWCASE DESCRIPTION
<u>CyberMoney®</u>	CyberBanque	<p>International CyberBanque, Ltd. (CyberBanque) has created new and unique payment solutions for consumers to pay for goods and/or services called CyberMoney®. Addressing threats posed by fraud, identity theft and merchant need for more efficient payments, CyberMoney® enables fast and secure mobile payment between consumer and merchant bank/credit union accounts.</p> <p>CyberMoney® is not cryptocurrency. Applications securely reside on consumer mobile devices and merchant POS devices, enabling end-to-end encrypted mobile payments. Upon deployment, applications work on most Android, iPhone and POS devices. CyberMoney® can be integrated into most digital wallets or stand alone as branded financial institution (FI) and/or merchant payment solutions.</p>
<u>D+H's Immediate Payments Solutions Suite</u>	D+H	<p>D+H provides a suite of Immediate Payments Solutions, including an Immediate Payment Hub, a Smart Gateway and an Aggregator Service, to meet the needs of any financial institution. Every day, our solutions enable millions of real-time payments globally, and provide connectivity to any real-time payment scheme. D+H's Immediate Payments Hub provides real-time payment capabilities in a full payment hub with payment processing. The Smart Gateway provides transformation, routing and connectivity, and integrates with any payment engine. Our Aggregator Service is a cost-effective solution for an occasional participant.</p>
<u>Faster Payments Rules</u>	ECCHO	<p>Given that there are no existing legal provisions governing online, real-time payments to guide courts in the resolution of disputes, having quality agreements (Rules) in place prior to those disputes can minimize and hasten resolution and avoid more expensive alternatives. The development of Rules requires an effective transparent, consensus building process. ECCHO has demonstrated its consensus building capabilities while chairing the Faster Payments Legal Work Group, by leading the passage of Check 21 and by continuing to support its broad constellation of members, participants and stakeholders. For additional information about ECCHO, please visit www.eccho.org.</p>

TABLE B: CAPABILITY SHOWCASE SUBMISSIONS (CONTINUED)

CAPABILITY NAME	COMPANY	SHOWCASE DESCRIPTION
<u>Frank J. Visintin</u>	Virtual Process Design, LLC.	<p>My proposal affords the capability for ubiquitous Central Bank cloud funds processing. Benefits include:</p> <ol style="list-style-type: none"> 1. Safety and security of funds transfers and postings. 2. Immediate OFAC response. 3. Immediate payer debit and payee credit good funds and/or not sufficient funds notifications and demand deposit postings. 4. Eliminates all paper processing at point of sale/input (ATM, retail store, lockbox operation, bank, non-bank, mobile, etc.); downstream processing equipment (MICR encoders, reader/sorters, imaging, etc.); float, fraud, adjustments, and returns; and reduces staff. 5. Enhances quick response code. 6. Enables cross-border transactions. 7. Includes under-banked and non-banked participation. 8. Savings offset implementation cost.
Independent Facilitator for Payments Rules and Standards	NACHA—The Electronic Payments Association	<p>NACHA—The Electronic Payments Association is a not-for-profit organization whose role is to work as an independent facilitator to assist the industry in developing payment rules and standards. NACHA utilizes a variety of ways to engage diverse parties to develop rules and standards—bringing flexibility, interoperability, and confidence to payments as technology, regulations, and the environment changes. While most known for its rules for the ACH Network, NACHA has been asked many times to work on other payment types with financial institutions, technology providers, other networks and associations, other countries, and end-users to find areas of commonality that benefit all.</p>
<u>NCR Faster Payments</u>	NCR	<p>NCR’s Faster Payments engine is built with tools enabling the creation, authorization and processing of transactions with fast response times for real-time payments. Our solution can be used by banks, aggregators, gateway providers or central infrastructure providers. Providing quick integration with other systems, channels or devices, financial institutions are rapidly enabled to process transactions in real-time. Additionally, paying banks can offer real-time guarantees for check deposits. For siloed systems, NCR Faster Payments consolidates services, streamlining connectivity to all interbank networks and improving efficiencies. Along with our Fraud Detection capability, NCR has a comprehensive solution for your real-time payments needs.</p>
<u>Ripple</u>	Ripple	<p>Ripple is a solution that empowers providers to make real-time cross-border payments. Cross-border payments today generally take two to four days to settle, with limited visibility into status and fees. Ripple enables full visibility into payment status, certainty of fees, and settlement in real-time.</p>

TABLE B: CAPABILITY SHOWCASE SUBMISSIONS (CONTINUED)

CAPABILITY NAME	COMPANY	SHOWCASE DESCRIPTION
<p><u>SupiPay Inc. by Moshulu Group</u></p>	<p>Moshulu Group, the shareholder and accelerator for SupiPay Inc.</p>	<ul style="list-style-type: none"> • The basis of SupiPay’s engineering solutions is the deep metaphysical understanding of the functions of Money • All functions are tightly integrated into a Centralised Electronic Control Center • All processes and peripheral units operate in Real-Time under Cybernetic Control • The system is designed for worldwide users • SupiPay offers all features as part of a complete commerce and banking platform, including: <ul style="list-style-type: none"> - Globally Scalable and Adaptable Payment Services Provider - Modular Core banking, Modular Front office, Mobile bank, Internet Bank - Multi-Currency Support, including Virtual Currencies - Real-Time handling of different Geo-locations and Time Zones - End-to-end Real-Time Transaction Processing with no intermediaries - Direct Alerts and Notifications—Push, SMS, Email, IVR as desired (carrier charges may apply) - Complete Business Solution, including CRM, Accounting, General ledger, Loyalty, and Coupon and Ticketing programs - Compatible with NFC, Card, QR Code, Direct Deposit and e-Deposit banking - Social B2C Advertising - End to end tokenized cryptography - Inexpensive and Easy to Use
<p><u>Tereon</u></p>	<p>Kalypton</p>	<p>The Tereon technology toolkit delivers true, real-time, transactions (i.e. completed in a single session) encompassing; settlement, clearing and authorization, and payment services. It does this within existing regulations, with a security model that designs out the flaws in legacy systems and extremely cost effectively. The Tereon hashchain delivers distributed trust in private ledgers. Tereon processes 1 million transactions per second on a single server.</p> <p>Tereon comes with 31 services “out of the box” plus a RAD/RP toolset for customers to customize or develop new services. It interoperates with other technologies via a series of open APIs and protocols.</p>

TABLE B: CAPABILITY SHOWCASE SUBMISSIONS (CONTINUED)

CAPABILITY NAME	COMPANY	SHOWCASE DESCRIPTION
<u>The Token Faster Payments System</u>	Token	<p>Token provides a new digital payments network that is modern, secure, instant, open, reachable worldwide with support for cross-border transactions.</p> <p>At the core of the Token system is a smart tokenization module that provides a powerful set of rules that control access to a Payer’s bank account for the purpose of making payments.</p> <p>Payer and Payee authentication and payment authorization are completed using digital signatures. This provides non-repudiation for all transactions and eliminates fraud and the potential for mass breaches.</p> <p>The Token API creates a new revenue stream for Providers, allowing developers to innovate in ways that wasn’t previously possible.</p>
<u>UP Immediate Payments</u>	ACI Worldwide, Inc.	<p>OUP Immediate Payments is a pre-packaged payments solution for real-time credit transfer, request for payment, direct debit and refund/recall messaging. It is a proven solution already in operation in the United Kingdom, Singapore and Australia, offering a full technical messaging scheme based on the ISO 20022 Real-Time Payments Group (RTPG) recommendations. It assures up-time with an active-active, 24x7 proven application foundation while offering a complete, flexible and advanced set of tools for a participant to configure new real-time offerings. The solution is offered with real-time fraud monitoring, including real-time scoring and payments analysis.</p>
<u>WingCash Payment Platform</u>	WingCash, LLC	<p>WingCash is the developer of an open-source payment platform to allow the safe and secure transfer of digital coins and bills.</p>

APPENDIX 3: U.S. PAYMENT SYSTEMS (NOT INTENDED TO BE ALL INCLUSIVE)

Table C gives an overview of key features of major payment systems in the United States today.

TABLE C: U.S. PAYMENT SYSTEMS

PAYMENT TYPE	EXAMPLES*	PROCESSING MODEL	VOLUME/ VALUE STATISTICS
Wire (credit-push)**	<p>High-value transactions between businesses and financial institutions, such as:</p> <ul style="list-style-type: none"> • Purchase and sale of Fed Funds • Purchase, sale, of securities transactions • Interbank transfers • Banking companies transfers (own account) • Corporate payments <p>Only a very small percentage of wire transfers are for low-value retail payments. For example, 10-15 percent of Fedwire payments are valued below \$1,000.⁵⁹</p>	<p>Individual wire payments are processed in real-time through two main systems: Fedwire⁶⁰ and CHIPS.⁶¹</p> <p>Fedwire is our national real-time gross settlement system, and payments entered into Fedwire are cleared and settled in real-time. Payments processed through Fedwire are irrevocable, with immediate finality.</p> <p>Wire payments processed through CHIPS are netted against one another throughout the day, with end of day settlement.</p>	<p>Compared with other payment types, wires represent a small number of payments but a very high value.</p> <p>In 2015, there were approximately 253 million wire payments in the U.S.⁶² with a total value of approximately \$1,200 trillion.⁶³</p>

TABLE C: U.S. PAYMENT SYSTEMS (CONTINUED)

PAYMENT TYPE	EXAMPLES*	PROCESSING MODEL	VOLUME/ VALUE STATISTICS
Automated Clearing House (ACH) (credit-push and debit-pull)**	<ul style="list-style-type: none"> • Direct deposit of payroll [B2P, credit-push] • Insurance claim payments [B2P, credit-push] • Bill payments [P2B, credit-push or debit-pull] • Corporate trade payments [B2B, credit-push or debit-pull] • Healthcare payments [B2B, credit-push] • Cash management (e.g., transferring money within a corporation from one account to another) [credit-push or debit-pull] • P2P payments facilitated by a bank or service provider (e.g., PayPal) [credit-push or debit-pull/credit-push combination] • Check conversions (e.g. lockbox, point of sale) [P2B or B2B, debit-pull] 	<p>ACH operates on a batch, store-and-forward model: individual payment requests are stored and grouped into batches throughout the day, rather than processing each payment separately.⁶⁴</p> <p>Most ACH payments are settled on the next business day. Same-day ACH payments have three settlement windows every 24-hours.</p>	<p>In 2015, there were approximately 23.5 billion ACH payments with a total value of approximately \$145.3 trillion.⁶⁵</p>
Cards*** (debit-pull)	<p>Cards are used to make many types of payments such as:</p> <ul style="list-style-type: none"> • Consumer payments for goods or services at the point of purchase (in-store or online/mobile) • Business payments using a company credit or debit card (e.g., supplies, travel and entertainment, vendor and supplier payments, etc.) • Prepaid cards are typically used for P2B purchases and bill payments 	<p>Debit/prepaid cards: Payments are authorized, approved, and cleared in real-time when transactions are processed through single-message.***</p> <p>Payments are authorized and approved in real-time, with batch clearing taking place later on (typically end-of-day) when transactions are processed through dual-message.***</p> <p>Credit cards: Payments are authorized and approved in real-time, with batch clearing taking place later on (typically end-of-day); all credit transactions are processed through dual-message.</p> <p>Card payments are netted against each other during the day, and settlement typically happens within two days after a payment is initiated.</p>	<p>In 2015, there were approximately 103.3 billion card payments, with a total value of approximately \$5.72 trillion.⁶⁶</p>

TABLE C: U.S. PAYMENT SYSTEMS (CONTINUED)

PAYMENT TYPE	EXAMPLES*	PROCESSING MODEL	VOLUME/ VALUE STATISTICS
Checks (debit-pull)	<ul style="list-style-type: none"> • P2P payments, such as paying a babysitter or a friend • Business supplier payments [B2B] • Consumer bill payments [P2B] • B2P payments, such as insurance claim payments 	<p>Check images are cleared in batches between financial institutions, processors, clearing houses, and the Federal Reserve.</p> <p>Checks are typically settled by the next business day.</p>	<p>In 2015, there were approximately 17.3 billion check payments, with a total value of approximately \$26.83 trillion.⁶⁷</p>
Cash (credit-push)	<ul style="list-style-type: none"> • P2P payments, such as paying a babysitter or a friend • Consumer payments for goods or services in stores, particularly for low-value items [P2B] • Business payments for out-of-pocket expenses [B2B] 	<p>Settlement happens immediately at the time of the transfer.</p>	<p>Although cash transactions are much harder to measure than other payment transactions, the Federal Reserve’s 2012 Diary of Consumer Payment Choice⁶⁸ shows that consumers use cash more frequently than any other payment type, particularly for low-value transactions.</p>

*In the examples given, the following abbreviations are used to represent the payer and payee, respectively, in each transaction: P2P (person-to-person), P2B (person-to-business), B2P (business-to-person), B2B (business-to-business)

**Credit-push payments are payments made when the payer sends the payment instruction to the payer’s account to transfer the payer’s funds to the payee. Debit-pull payments are payments made after prior authorization by the payer; the payee sends the payment instruction to the payee’s account to draw on funds from the payer. See the Glossary of Task Force Terms: <https://fedpaymentsimprovement.org/resources/glossary/>.

***Different types of card payments are processed differently: debit card, prepaid card, and ATM transactions are often approved and cleared using a single message; credit and some debit and prepaid card transactions are processed using a dual-message system, with clearing taking place at a later time. For more information on card processing, see the Federal Reserve Bank of Philadelphia’s *Clearing and Settlement of Interbank Card Transactions: A MasterCard Tutorial for Federal Reserve Payments Analysts* (Oct 2013), available at <https://www.philadelphiafed.org/consumer-credit-and-payments/payment-cards-center/publications>. In addition, recently card networks have enabled credit-push transactions for sending to or from card accounts.

APPENDIX 4: GOVERNANCE AND REGULATORY LANDSCAPE (NOT INTENDED TO BE ALL INCLUSIVE)

Table D gives an overview of key governance bodies, laws, rules, and regulations across major U.S. payment systems. The table does not describe federal and state competition laws or regulatory policies governing unfair, deceptive, or abusive acts and practices, many of which also apply to payment systems and providers.

TABLE D: GOVERNANCE AND REGULATION OF U.S. PAYMENT SYSTEMS

PAYMENT TYPE	GOVERNANCE/ RULE-MAKING BODIES	LAWS, RULES, AND REGULATIONS
Wire	The two major wire operators are the <u>Federal Reserve</u> (Fedwire) and <u>The Clearing House</u> (CHIPS). These operators determine rules for participating banks.	Laws and regulations that affect wire transfers: <ul style="list-style-type: none"> • <u>The Federal Reserve Act</u> sections 11 and 13 • <u>Uniform Commercial Code</u> (U.C.C.) Article 4A • <u>Regulation J</u> • <u>Regulation CC</u> • <u>Dodd-Frank</u> (section 1073) and <u>Regulation E</u> (Electronic Fund Transfer Act) <p>The Federal Reserve and The Clearing House determine operating rules.</p>
ACH	The two ACH operators are the Federal Reserve (FedACH) and The Clearing House (EPN). <u>NACHA</u> is a non-profit rule making association for the ACH system. Financial institutions can join NACHA directly or through a regional association.	Laws and regulations that affect ACH payments: <ul style="list-style-type: none"> • <u>The Federal Reserve Act</u> section 11A(b)(4) • <u>U.C.C.</u> Article 4A • <u>Regulation E</u> • <u>Regulation CC</u> • U.S. Treasury regulations (<u>Green Book</u>) <p>Additional rules are established by NACHA and the two ACH operators: the Federal Reserve (under Operating Circular 4) and The Clearing House</p>

TABLE D: GOVERNANCE AND REGULATION OF U.S. PAYMENT SYSTEMS (CONTINUED)

PAYMENT TYPE	GOVERNANCE/ RULE-MAKING BODIES	LAWS, RULES, AND REGULATIONS
Cards	Private card networks determine rules for the system. Currently, there are a handful of major national networks and over a dozen PIN debit networks.	Laws and regulations that affect card payments: Debit cards: <ul style="list-style-type: none"> • Regulation E • Regulation II Credit cards: <ul style="list-style-type: none"> • The Truth in Lending Act (TILA) • The Credit CARD Act • Regulation Z, which implements the TILA and the Credit CARD Act
Checks	Financial institutions can clear check payments directly, through clearing houses, or through the Federal Reserve Banks. The Electronic Check Clearing House Organization (ECCHO) is a non-profit organization that writes check image rules for check exchange among participating banks.	Laws and regulations that affect check processing: <ul style="list-style-type: none"> • The Federal Reserve Act sections 11A(b)(2); 13.1; 16.13 • U.C.C. Articles 3 and 4 • Expedited Funds Availability Act (EFAA) • Check Truncation for the 21st Century Act • Regulation CC • Regulation J Additional rules are developed by ECCHO for bank-to-bank and clearing house check image exchange and by the Federal Reserve for check collection and return (under Operating Circular 3).
Cash	The U.S. Constitution Article 1, Section 8 gives Congress the power to mint money. The U.S. Treasury has enacted regulations defining the structure and functions of the US Mint and Bureau of Engraving and Printing. The Federal Reserve has authority to provide coin and currency services to depository institutions.	Laws and regulations that affect cash (currency and coin): <ul style="list-style-type: none"> • 31 U.S. Code 5103, 5111-5115 • The Federal Reserve Act section 11A(b)(1) • Bank Secrecy Act

ENDNOTES

Section 1: Task Force Background and Process

Introduction

¹ The Secure Payments Task Force was established with a mandate to advise the Federal Reserve on payment security matters and determine priorities for future action to promote payment system safety, security, and resiliency. In addition, the Secure Payments Task Force was tasked to support the Faster Payments Task Force in evaluating the security features of new or modified faster payments infrastructure proposals. For more information, see <https://fedpaymentsimprovement.org/payments-security/task-force/>.

Task Force Mission and Objectives

² A ubiquitous payment system “can reach all Accounts to ensure that a Payer has the ability to pay any Entity.” See <https://fedpaymentsimprovement.org/resources/glossary/>.

Task Force Process

³ The task force defined a solution as “The collection of Components and supporting Parties that enable the end-to-end payment process. A faster payments Solution might include new Components, the adaptation of existing Components, and/or a combination of the two. Components include any of the following: 1) rules, standards/protocols, and procedures, 2) physical or technical infrastructure, networks, systems and other resources needed by all Parties to use or enable the rules, standards/protocols and procedures, 3) centralized or shared services, if any, and 4) Legal Framework and enforcement mechanisms. Parties include any of the following: governing bodies, operators, Depository Institutions, Regulated Non-Bank Account Providers and third-party service providers. See <https://fedpaymentsimprovement.org/resources/glossary/>.

⁴ The full list of criteria can be found at <https://fedpaymentsimprovement.org/wp-content/uploads/fptf-payment-criteria.pdf>.

⁵ “Providers” refers to three categories of institutions/organizations: 1) Depository Institutions (any institution eligible for a Federal Reserve Account), 2) Regulated non-Bank Account Providers that are classified as money service businesses or money transmitters, or broker-dealers, and are subject to federal or state regulation, and 3) Third-party service providers (e.g. , non-account holding providers of technology, software, network services, processing services, mobile wallets, equipment, security services, program managers, etc.) See <https://fedpaymentsimprovement.org/resources/glossary/>.

⁶ For an explanation of high-priority use cases for faster payments, see [criteria U.6](#) “Applicability to multiple use cases”

Section 2: U.S. Payments Landscape and Benefits of Safe, Ubiquitous Faster Payments

Introduction

- ⁷ As used throughout the remainder of this report, businesses may also include government agencies that make or receive payments.
- ⁸ This is an estimate of all non-cash payments (excluding wire transfers) from the *Federal Reserve Payments Study 2016*, pg. 2. This estimate is preliminary at the time of publication and may be subject to change.
- ⁹ ACH is an electronic payment network that transfers funds between bank accounts. See <https://www.nacha.org/news/what-ach-quick-facts-about-automated-clearing-house-ach-network> for details.
- ¹⁰ An end user is “an Entity that uses a payment Solution, payment network, or payment service for the purpose of making or receiving payments, such as a business or a Consumer.” See <https://fedpaymentsimprovement.org/resources/glossary/>.
- ¹¹ See the FDIC’s National Survey of Unbanked and Underbanked Households at <https://www.fdic.gov/householdsurvey/> for details.
- ¹² An entity may be a “person, business, government agency, financial institution or other service provider.” See <https://fedpaymentsimprovement.org/resources/glossary/>.
- ¹³ Good funds are “funds in an Account that are unconditionally available and usable immediately by the owner of the Account.” See <https://fedpaymentsimprovement.org/resources/glossary/>.
- ¹⁴ *Effectiveness Criteria* S.3 specifies that effective faster payment solutions should define a point in time after approval of good funds (and no later than when funds are made available to the payee) when the payment becomes final and irrevocable. Rules and/or a supporting legal framework should be in place to ensure payment finality, and the exact point of irrevocability should be easily understood by and visible to the payee with mechanisms in place to protect the payer in case of disputes.
- ¹⁵ Based on the definition of “Settlement” found in http://www.bis.org/cpmi/glossary_030301.pdf, pg. 45.

Why Faster Payments? Why Now?

- ¹⁶ For more detail see the Federal Reserve’s end-user research study which can be found in Appendix 3 of *Strategies for Improving the U.S. Payment System*, <https://fedpaymentsimprovement.org/wp-content/uploads/strategies-improving-us-payment-system.pdf>, pg. 28.

U.S. Payments Landscape

- ¹⁷ This statistic includes payments made with non-prepaid debit cards as calculated in the *Federal Reserve Payments Study 2016*, which can be found at <https://www.federalreserve.gov/newsevents/press/other/2016-payments-study-20161222.pdf>.
- ¹⁸ Although cash payments are much harder to measure than other types of payments, the Federal Reserve’s *2012 Diary of Consumer Payment Choice* shows that consumers use cash more frequently than any other payment type, particularly for low-value transactions. See <http://www.frbsf.org/cash/publications/fed-notes/2014/april/cash-consumer-spending-payment-diary>.
- ¹⁹ See the *Federal Reserve Payments Study 2016*, which can be found at <https://www.federalreserve.gov/newsevents/press/other/2016-payments-study-20161222.pdf>.
- ²⁰ Ibid. At the time of publication total ACH payments are preliminary and may be subject to change. This statistic excludes wire transfers which are typically high-value payments. For more detail on the total volume and value of wire transfers, refer to [Appendix 3](#).
- ²¹ Ibid. At the time of publication this estimate is preliminary and may be subject to change.

- ²² At the time of publication these estimates are preliminary and may be subject to change. See the *Federal Reserve Payments Study 2016* at <https://www.federalreserve.gov/newsevents/press/other/2016-payments-study-20161222.pdf> for details.
- ²³ At the time of publication ACH payment estimates are preliminary and may be subject to change. See the *Federal Reserve Payments Study 2016* at <https://www.federalreserve.gov/newsevents/press/other/2016-payments-study-20161222.pdf> for details.
- ²⁴ See the *BAI Consumer Market Pulse Survey* (June 2016). Study results are available at https://info.bai.org/BAIRetailBankingOutlook041316_Archive.html?_ga=1.135994673.1653017869.1386620247.
- ²⁵ Blockchain is a type of distributed ledger technology originally developed to cryptographically verify and record transactions made using digital currency. This technology allows for blocks of completed transactions to be verified by a distributed network of computers and added to a public ledger that lists all transactions made on the network.
- ²⁶ For more detail, see Appendix 3 of *Strategies for Improving the U.S. Payment System* <https://fedpaymentsimprovement.org/wp-content/uploads/strategies-improving-us-payment-system.pdf>, pg. 28.
- ²⁷ Ibid.
- ²⁸ EMV (short for Europay MasterCard and Visa) refers to “specifications developed by Europay, MasterCard, and Visa that define a set of requirements to ensure interoperability between payment chip cards and terminals.” See the EMV Migration Forum’s *Communications & Education Working Committee Standardization of Terminology Version 2.1*, available for download at <http://www.emv-connection.com/standardization-of-terminology/>.
- ²⁹ Tokenization is “the process of replacing sensitive Data (e.g. , Account information) with unique identifiers (i.e. , tokens) that either replace or mask attributes associated with the original Data set.” See <https://fedpaymentsimprovement.org/resources/glossary/>.
- ³⁰ *The Payment Card Industry (PCI) Data Security Standard Glossary* defines encryption as the “process of converting information into an unintelligible form except to holders of a specific cryptographic key. Use of encryption protects information between the encryption process and the decryption process (the inverse of encryption) against unauthorized disclosure.” See https://www.pcisecuritystandards.org/pdfs/pci_dss_glossary_v1-1.pdf.
- ³¹ “Biometric authentication uses one or more of a person’s physical attributes [e.g. fingerprint or facial recognition] to validate the person’s identity.” See the Federal Reserve Bank of Atlanta’s *Improving Customer Authentication* working paper (April 2015) at https://www.frbatlanta.org/-/media/Documents/rprf/rprf_pubs/improving-customer-authentication.pdf.
- ³² Merriam Webster defines artificial intelligence as: “a branch of computer science dealing with the simulation of intelligent behavior in computers.” See <http://www.merriam-webster.com/dictionary/artificial%20intelligence>. This can include complex problem solving and reasoning capabilities that may help to streamline fraud and risk management processes.
- ³³ For more detail, see Appendix 3 of *Strategies for Improving the U.S. Payment System* <https://fedpaymentsimprovement.org/wp-content/uploads/strategies-improving-us-payment-system.pdf>, pg. 29.
- ³⁴ [Effectiveness Criteria](#) U.4 provides greater detail on these contextual data capabilities.
- ³⁵ The International Organization for Standards (ISO) is an organization that develops and publishes international standards for a variety of products and business areas. ISO 20022 is a set of XML, or extensible markup language, messaging standards used by the financial industry to create consistent international message formats based on a shared data dictionary and business process model. See <http://www.iso20022.org/> for more information.

- ³⁶ See SWIFT Info Paper *ISO 20022 for Financial Institutions, Best Practice for Successful Implementation* (June 2016), pg. 4, which is available for download at <https://www.swift.com/your-needs/iso-20022>.
- ³⁷ For more information on e-invoicing, see the Federal Reserve Bank of Minneapolis Payments, Standards and Outreach Group's *U.S. Adoption of Electronic Invoicing: Challenges and Opportunities* (June 2016) at <https://fedpaymentsimprovement.org/wp-content/uploads/e-invoicing-white-paper.pdf>.
- ³⁸ Note that the CFPB has issued a Remittance Transfer Rule to provide protections to consumers who transfer money abroad. See <http://www.consumerfinance.gov/policy-compliance/rulemaking/final-rules/electronic-fund-transfers-regulation-e/> for a summary of these rule changes.
- ³⁹ See [https://www.iso20022.org/sites/default/files/documents/general/ISO20022 RTPG.pdf](https://www.iso20022.org/sites/default/files/documents/general/ISO20022_RTPG.pdf) and <http://www.ipf-a.org/> for details on these organizations.

Global Implementations of Faster Payments

- ⁴⁰ The definition of “faster” or “real-time” payment systems varies from one study to another, leading to a variation in the number of faster payment systems identified around the world. For example, some studies only include payment systems with 24x7 availability or real-time end-user experience, while others use a broader classification. The primary source used for this analysis was *FIS Flavors of Fast 2016: A trip around the world of immediate payments*, available for download at <http://insights.sungard.com/Flavors-of-Fast-2016.html>. For additional details, see the Reserve Bank of Australia's *Fast Retail Payment Systems* (Dec 2014) at <http://www.rba.gov.au/publications/bulletin/2014/dec/pdf/bu-1214-6.pdf>.
- ⁴¹ See *FIS Flavors of Fast 2016: A trip around the world of immediate payments*, available for download at <http://insights.sungard.com/Flavors-of-Fast-2016.html> for details.
- ⁴² For more details on settlement options for real-time payments systems, see the SWIFT Institute's *Near Real-Time Retail Payment and Settlement Systems Mechanism Design* (Sept 2015) at <https://www.swiftinstitute.org/wp-content/uploads/2015/11/WP-No-2014-004-1.pdf>.
- ⁴³ See Appendix 6 of *Strategies for Improving the U.S. Payment System* <https://fedpaymentsimprovement.org/wp-content/uploads/strategies-improving-us-payment-system.pdf>, pg. 37.
- ⁴⁴ Very little public information is currently available on Iceland's faster payment system, but the name of the system be found at <http://www.sepaforcorporates.com/sepa-payments/real-time-payments-systems-around-world/>.
- ⁴⁵ For example, the Zengin system in Japan was expanded to allow 140 characters to be transmitted with a payment, extended from its original constraint of 20 characters. See the Reserve Bank of Australia's *Fast Retail Payment Systems* (Dec 2014) at <http://www.rba.gov.au/publications/bulletin/2014/dec/pdf/bu-1214-6.pdf>.
- ⁴⁶ See the UK's *Annual Summary of Payment Statistics 2015* at <http://www.fasterpayments.org.uk/sites/default/files/Annual%20Summary%20of%20Payment%20Statistics%202015.pdf>. The total volume of Faster Payments in the UK in 2015 was roughly 1.2 billion payments compared to roughly 6 billion Bacs payments in 2015.
- ⁴⁷ See Appendix 6 of *Strategies for Improving the U.S. Payment System* <https://fedpaymentsimprovement.org/wp-content/uploads/strategies-improving-us-payment-system.pdf>, pg. 45.
- ⁴⁸ For example, Finland has estimated an annual cost savings from e-invoicing of approximately \$3 billion. See Nordic Business Report *Finland and Denmark Lead Race to Achieve EU e-Invoicing Goals* (Apr 2016) at <https://www.nbforum.com/nbreport/finland-and-denmark-lead-race-to-achieve-eu-e-invoicing-goals/>.
- ⁴⁹ See <http://www.europeanpaymentscouncil.eu/index.cfm/sepa-instant-payments/what-are-instant-payments/> for more information.

Broad Benefits of Safe, Ubiquitous Faster Payments

⁵⁰ See Appendix 6 of *Strategies for Improving the U.S. Payment System* <https://fedpaymentsimprovement.org/wp-content/uploads/strategies-improving-us-payment-system.pdf>, pg. 38-39.

⁵¹ See the CGI report *Exploring the Business Case for Immediate Payments* (2016), which can be found at https://www.cgi.com/sites/default/files/files_be/pdf/wp_fs_immediate_payments_jrv_v2.pdf.

⁵² Ibid

⁵³ The cost of making and receiving payments using current payment systems represents economic activity that is estimated at roughly 0.5 percent to 3 percent of annual GDP. See the Federal Reserve Bank of Kansas City Economic Review *Measuring the Costs of Retail Payment Methods* (Q2 2012) at <https://www.kansascityfed.org/publicat/econrev/pdf/12q2Hayashi-Keeton.pdf>, The European Bank Occasional Paper Series *The Social and Private Costs of Retail Payment Instruments* (2012) at <https://www.ecb.europa.eu/pub/pdf/scpops/ecbocp137.pdf>, and the Journal of Financial Services Research *The Check's in the Mail: Why the United States Lags in the Adoption of Cost-Saving Electronic Payments* (2000) at <http://link.springer.com/article/10.1023/A:1008163308353>.

⁵⁴ See FIS *Flavors of Fast 2016: A trip around the world of immediate payments*, available for download at <http://insights.sungard.com/Flavors-of-Fast-2016.html>.

Benefits for Providers and End Users of Faster Payments

⁵⁵ **Effectiveness Criteria** U.1.4 states that “the Solution should effectively address the needs of the unbanked or underserved to affordably send or receive payments. For example, it should support the ability to make payments to/from Regulated Non-Bank Provider and/or explicitly promote financial inclusion in the payments Solution.”

⁵⁶ Unbanked consumers do not use a traditional bank account or financial services, while underbanked consumers have access to a bank account but also use alternative financial services such as check cashing. The FDIC found that in 2015, 7 percent of U.S. households were unbanked, with an additional 19.9 percent of U.S. households classified as under-banked. See <https://www.fdic.gov/householdsurvey/> for more detail.

⁵⁷ A report from the Center for Financial Services Innovation, *Beyond Check-cashing: An examination of consumer demand and business innovation for immediate access to check funds* (June 2014) found that a large number of consumers who utilize check cashing either already have a bank account or would qualify for one, but prefer the speed and convenience of check cashing services that provide quick access to cash and easy management of cash balances. See http://cfsinnovation.s3.amazonaws.com/RESEARCH_FIS_CFSI_BeyondCheckCashing_6.3.2014_FINAL.pdf.

⁵⁸ **Effectiveness Criteria** S.3.1 requires “the Payer’s Depository Institution or Regulated Non-bank Account Provider to approve each payment following payment Initiation to assure the Payer’s Account has Good Funds.” A solution that allows the authorizing entity to decline transactions when insufficient funds are available may benefit consumers by helping them to avoid overdraft fees.

Appendices

U.S. Payment Systems

⁵⁹ Source: Federal Reserve Bank of New York Money and Payment Studies staff calculations.

⁶⁰ See <https://frbervices.org/fedwire/index.html> for more information.

⁶¹ See <https://www.theclearinghouse.org/payments/chips> for more information.

⁶² This is a summation of annual 2015 statistics from [Fedwire](#) (142.76 million payment transfers) and [CHIPS](#) (110.4 million payment transfers).

⁶³ This is a summation of annual 2015 statistics from [Fedwire](#) (\$834.6 trillion) and [CHIPS](#) (\$375.9 trillion).

⁶⁴ See NACHA's website for details: <https://www.nacha.org/ach-network>.

⁶⁵ Statistics were taken from the *Federal Reserve Payments Study 2016* which can be found at <https://www.federalreserve.gov/newsevents/press/other/2016-payments-study-20161222.pdf>. At the time of publication ACH payment estimates are preliminary and may be subject to change.

⁶⁶ Statistics were taken from the *Federal Reserve Payments Study 2016* which can be found at <https://www.federalreserve.gov/newsevents/press/other/2016-payments-study-20161222.pdf>.

⁶⁷ Ibid

⁶⁸ See the Federal Reserve Bank of San Francisco's *Cash Continues to Play a Key Role in Consumer Spending: Evidence from the Diary of Consumer Payment Choice* (Apr 2014), which can be found at <http://www.frbsf.org/cash/publications/fed-notes/2014/april/cash-consumer-spending-payment-diary>.