



# MODERNIZATION TARGET STATE

---

*Summary of the Key Requirements, Conceptual End State, Integrated Work Plan and Benefits of the Modernization Program*

December 2017

[payments.ca](http://payments.ca)

---

# CONTENTS

1. INTRODUCTION	5
2. TARGET STATE	8
2.1 Payment Systems Overview	8
2.2 Regulatory Framework	10
Regulatory Environment	10
A Standards Framework to Design the Future Payment Systems	10
Other Regulatory Considerations	11
2.3 Access Model	11
General Assumptions	12
System Access: Eligibility Criteria versus Participation Requirements	12
2.4 High-Value Payment System – Lynx	13
Lynx Financial Risk Model	14
Assessing Potential Lynx Solutions	15
Lynx Settlement Cycle and Payment Flow	16
Phased Approach	18
Assumptions on Access to Lynx	18
2.5 Real-Time Rail (RTR)	18
Scope of RTR	19
RTR Ecosystem	20
Access Assumptions for RTR	21
RTR Risk and Settlement Model	22
2.6 Batch System - SOE	23
Phased Approach	23
SOE Settlement Process	26
SOE Financial Risk Model	27
Closing PPS Standard Gaps	28
Assumptions on Access to SOE	28
2.7 Batch Payment Stream: Enhance Automated Funds Transfer (AFT)	29
AFT Enhancements Objective	29
Phase I	29

---

Phase II	30
2.8 ISO 20022 Strategy	31
ISO 20022 Adoption Strategy	32
2.9 Policy and Legal Framework	33
Policy, Legal and Governance Oversight	34
The Modernization Program Policy Changes	34
3. INTEGRATED PLAN	36
3.1 Guiding Principles	36
3.2 Work Plan for 2018	36
ACSS	37
Lynx	37
RTR	37
Settlement Optimization Engine (SOE)	38
AFT Phase I	39
Preparing for AFT Phase II	40
Additional Priorities for the Modernization Program	40
Scope of Delivery Phases	41
3.3 The Delivery Roadmap (2017)	41
Confidence Levels	42
Business Stages of Delivery	43
3.4 Risk Management	44
Context	44
Risks Across the Ecosystem	45
Delivery Risk Management	46
Next Steps for Risk Management	46
4. BEYOND MODERNIZATION	47
4.1 Potential Future State of Payment Systems (2021+)	47
The Future of Payments in Canada	47
Potential Payment Migration Scenarios	48
4.2 Future Work	50
5. BENEFITS OF MODERNIZATION	51
5.1 Five Core Benefits of Modernization	52
Faster and More Efficient	52
Richer Data	55

---

More Convenient	58
Interoperable	59
Greater Security, Risk Management and Privacy	60
Next Steps	62
6. APPENDIX	63
6.1 Reference Material	63
6.2 Glossary	63

---

# 1. INTRODUCTION

Payments Canada's Modernization journey began in 2015 and is being documented through a series of industry publications including a **Vision for the Canadian Payment Ecosystem** (the Vision), published April 2016 and the **Industry Roadmap and High-Level Plan** (the Roadmap), published December 2016.

The Vision identified the needs for the Canadian marketplace and the Roadmap outlined – at a high level – what the industry could do to begin to deliver on those needs. The **Modernization Target State** provides a more detailed view of the program, including descriptions of the planned modernized systems and their fundamental support structures, such as risk and regulatory frameworks and access models. This document also gives a view of the target end state for Modernization, how modern systems will integrate, the potential migration of payment types and the anticipated benefits for the Canadian economy, businesses and households.

The descriptions within this document were informed by the significant work to define and refine requirements for modern systems alongside our member financial institutions and key stakeholders across business and government. The descriptions are also influenced by learnings absorbed through ongoing procurement initiatives, research and consultation. It should be noted that this same work has informed and refined the preliminary timelines and design considerations outlined in the Roadmap. Attentive readers will note the following key plan changes since the publication of the Roadmap:

- **Lynx**, the new core clearing and settlement system, was originally described as a replacement for both the Large Value Transfer System (LVTS) and Automated Clearing Settlement System (ACSS). **The Settlement Optimization Engine (SOE)**, as a component of Lynx, would perform the clearing functions for retail batch payments. New regulatory requirements as well as further research and consultation suggested that the scope of SOE should expand to perform the functions of a full retail batch payment system, including support for the centralized exchange of payments messages for some of the electronic payment streams. As such, Lynx and the SOE have been decoupled in terms of delivery. The SOE planning is going through extensive review and requires continued collaboration with the industry to reach a final end state; however, it is currently envisioned that SOE will be delivered in three phases. Phase I, expected to be delivered by 2021, will include a new technology platform to meet selected requirements from Bank of Canada's Prominent Payment System (PPS) Standards. Phase II will meet all regulatory requirements from Bank of Canada's PPS standards, and provide for both centralized exchange and bilateral exchange for certain electronic payment streams. Finally, in Phase III, all participants would move to a centralized exchange model for supported electronic payment streams, at their own pace, through market driven migration based on efficiency and their own batch system modernization plans. Of course, this change also means the term "Settlement Optimization Engine" no longer adequately describes the functions of the system. As such, the SOE will be renamed. Further details and timelines are found in Section 2.6.
- The Roadmap outlined enhancements to **Automated Funds Transfer (AFT)** in two phases. Phase I included delivering an additional exchange window to better serve Western Canada and faster funds availability, and Phase II included mandating the ISO 20022 message format, adding more exchange windows, and delivering even faster funds availability. During the requirements definition, it became clear that ISO 20022 implementation should be the sole focus of Phase II. As such, the

additional features in Phase II will be considered as possible subsequent phases once the business benefits of Phase I have materialized and are evaluated.

Canada’s payments Modernization is a complex, multi-year program with far reaching impacts on the entire Canadian financial services industry. From the outset, Payments Canada has committed to Modernization as an industry journey, with consultation as a central tenet to its success. In keeping with this principle, Payments Canada is pleased to share our work thus far and, throughout this Modernization Target State document, has highlighted where further exploration, investigation or deliberation is underway on items and issues that have yet to be solved. Where possible, Payments Canada has outlined the approach and timeline to close out these areas.

As Payments Canada progresses along the journey, a series of business, technology and operational changes will be implemented. In advance of these changes and as Payments Canada opens access to the systems, analysis will be carried out to develop appropriate risk, liability and compliance frameworks, to fulfill Payments Canada's public policy objectives and to align with our risk appetite and those of members. Moreover, Payments Canada’s delivery Roadmap continue to have varying degrees of confidence in timing estimates for different systems. Payments Canada is committed to providing an update to validate the current strategy against the situation in the market every six months and to publish an annual update on the Delivery Roadmap and progress. In order to support members’ financial planning cycle, the first check-point to reconfirm the Delivery Roadmap will be in Q2-2018.

**Refresher: Vision for the Canadian Payments Ecosystem**

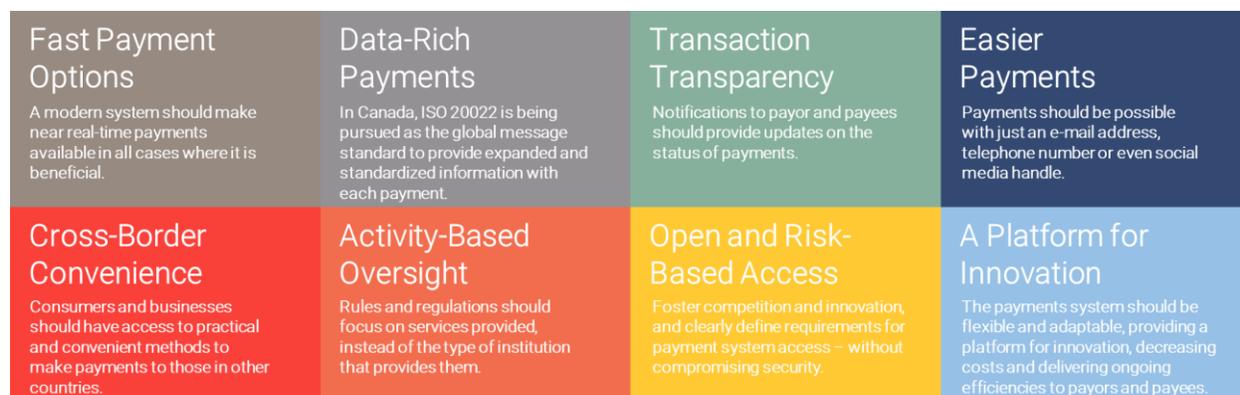
The first step in the Modernization initiative was to conduct in-depth research and consult with a broad range of users and stakeholders in development of a Vision for the Canadian Payments Ecosystem.

The findings of the Vision incorporated input from more than 100 organizations and set the context for Modernization, defining the user needs and desired features that should be addressed by a modernized payment system.

**Vision for the Canadian Payments Ecosystem:**

“A modern payment system that is fast, flexible and secure, promotes innovation and strengthens Canada’s competitive position.”

The vision work identified eight key needs of the Canadian marketplace:



**Figure 1: Payments Canada Vision - 8 Key Canadian Marketplace Needs**

---

## **Refresher: Industry Roadmap and High-Level Plan**

Using the Vision as a guide, Payments Canada – in collaboration with financial institutions and industry stakeholders– developed the Industry Roadmap and High-Level Plan.

Where the Vision told us *what* is needed in the marketplace, the Roadmap focused on *how* Payments Canada and the industry could begin to deliver on those needs.

The Roadmap is based on five major initiatives or pillars. Together, these pillars represented a first step towards modernized Canadian payment systems:

### **1) Build a New Core Clearing and Settlement System**

To provide a foundation for future changes, Canada needs a new core clearing and settlement infrastructure that meets international standards for managing risk in both high-value and retail payments and that has modern technical and risk management architecture. The new system will be a real time gross settlement system (RTGS), will employ the most recent liquidity savings mechanisms and will be based on the ISO 20022 data standard.

*Note: Further research, consultation and new regulatory requirements have expanded this scope to two systems - a replacement High-Value Payment System (Lynx) and a new Batch Payment System to replace the ACSS (SOE).*

### **2) Provide a Faster Payment Capability in the Form of a Real-Time Rail (RTR)**

Payments Canada will introduce a real-time payment capability in the form of a Real-Time Rail RTR, which will serve as a platform for innovation in the Canadian ecosystem. As the operator of the system, Payments Canada will ensure the system satisfies the criteria for Prominent Payment Systems, determine access criteria, set the legal and rules framework, determine pricing to participants and set the future development roadmap of the system. Payments Canada will rely on a service provider to deliver the system's underlying infrastructure. The capabilities of the system will satisfy the key elements of the Vision; including irrevocable payments with near real-time funds availability, rich remittance information through ISO 20022, as well as enhanced functionality to support overlay services that serve both consumers and businesses.

### **3) Enhance the Batch Automated Funds Transfer (AFT), Including Additional Exchange Windows and ISO 20022**

AFT batch payments, such as payroll, will continue to operate along with any new real-time payment system. These will be ISO 20022-enabled and will facilitate faster funds availability for beneficiaries and add additional clearing exchange windows to better serve Canadians across the country.

### **4) Align with Global Regulatory Standards**

The designation of the ACSS as a Prominent Payment System by the Bank of Canada means it must adhere to global regulatory standards and more stringent risk guidelines. Changes will be implemented to the ACSS and any modernized systems to meet new regulatory requirements and align with global standards.

### **5) Modernize the Policy and Rules Framework**

The development of a modern by-law and rule set for high-value and retail payments will enable Payments Canada's policy and regulatory rules framework to remain relevant, reflect current market practices, achieve the appropriate balance between flexibility and prescriptiveness, as well as to facilitate innovation.

---

## 2. TARGET STATE

### 2.1 Payment Systems Overview

To meet Canada's payments needs as outlined in the Vision, Payments Canada has identified a requirement for payment systems that support a range of current and future use cases, across a broad spectrum of market segments and users.

Payments Canada envisions a three-system end state consisting of a high-value system, a batch system, and a real-time (low-value) system. The three-system end state ensures the optimal fulfilment of Canadians' payments needs, accounts for fundamental differences in how payments are made (e.g., push vs. pull transactions, irrevocability, cost effective vs. fast), and coincides with both research and experience from other jurisdictions. A common messaging standard will be introduced with ISO 20022 as the underlying foundation of all three systems.

To deliver this end state, Payments Canada intends to build a payments infrastructure where the three payment systems will coexist and complement one another, by fulfilling unique roles within the payments ecosystem. The roles of these three systems are depicted in Figure 2 on the following page.

Payments Canada's goal is to create a payments ecosystem where modern systems optimize the way Canadians make payments. They will have a richer set of viable payment options to meet their needs, and the user experience will enable Canadians to focus on the parameters of the payment (e.g., speed, cost efficiency) rather than the method of transfer (e.g., wire, AFT, EDI, real-time payment).



**Figure 2: Overview of Three Core Payments Systems post-Modernization**  
 Note: The name SOE is currently being used for project delivery purposes only and will be change. The name RTR, often referred to as real-time rail, or real-time payments system, is also for project purposes only and will also be changed.

---

## 2.2 Regulatory Framework

### Regulatory Environment

The Canadian Payments Act (CP Act) sets out the legal framework for Payments Canada, including its mandate, the types of organizations eligible for membership, the role of the Board of Directors, and oversight responsibilities of the Minister of Finance. Under the CP Act, the objects of Payments Canada highlight three key aims: operating the core systems, facilitating interoperability, and facilitating innovation.

In pursuing its objects, Payments Canada shall promote the efficiency, safety, and soundness of its clearing and settlement systems and consider the interests of users.

The Payment Clearing and Settlement Act (PCSA) assigns the Bank of Canada (the Bank) responsibility for overseeing clearing and settlement systems which it has designated for controlling systemic risk or payment system risk.

### A Standards Framework to Design the Future Payment Systems

Payments Canada's LVTS is designated as a Systemically Important Payment System (SIPS) under the PCSA and, as a result, is subject to the Bank's oversight. The Bank adopted the CPMI-IOSCO<sup>1</sup> Principles for Financial Market Infrastructures (PFMIs) as part of its risk management standards for designated FMIs (FMI Standards). As a designated FMI by the Bank, LVTS is subject to these FMI Standards.

Payments Canada's ACSS was designated as a Prominent Payment System (PPS) by the Bank in 2016, which means the ACSS has the potential to pose payment system risk. As a result of the designation, ACSS is also subject to the Bank's oversight and must meet the Bank's Risk Management Standards for PPS standards. The Bank's PPS Standards are based on its FMI Standards but were modified to reflect that a PPS faces risks of a different nature and lower magnitude than SIPS do; PPS Standards and their application are, therefore, proportional to the risks present in the PPSs.

In designing the three modernized payment systems, Payments Canada looks to the Bank's FMI Standards<sup>2</sup>, the PPS Standards, and the PFMIs on which they are based, as well as supplementary guidelines such as CPMI-IOSCO's guidance on cyber resilience for FMIs to provide a foundation and framework for achieving safety, soundness, and efficiency.

- **Safety and Soundness:** The PFMIs note that to achieve the safety outcome, FMIs should robustly manage their risks. Therefore, the PFMIs, and in turn the Bank's FMI Standards, set out the key risks faced by FMIs (such as legal, credit, liquidity, general business, and operational risks) and the regulatory expectations on how these risks should be managed.

---

<sup>1</sup> CPMI - IOSCO (Committee on Payments and Market Infrastructure - International Organization of Securities Commissions)  
[https://www.iosco.org/about/?subsection=cpmi\\_iosco](https://www.iosco.org/about/?subsection=cpmi_iosco)

<sup>2</sup> <http://www.bankofcanada.ca/core-functions/financial-system/bank-canada-risk-management-standards-systemic-fmis/>

- 
- **Efficiency:** The PFMI's also provide context on the efficiency objective, noting that efficiency refers to the use of resources by the FMIs and their participants in performing their functions, but adds that cost considerations should not take precedence over the establishment of prudent risk management practices<sup>3</sup>. In other words, FMIs, including payment systems, are expected to balance the safety and efficiency public policy objectives when providing their services and designing their systems.

Payments Canada will ensure Lynx and SOE fully meet their respective standards and will design the RTR in accordance with the PPS Standards which provide a basis for risk management best practices.

## Other Regulatory Considerations

Safe and sound payment systems are important for the stability of the Canadian financial system. The Bank of Canada as a regulator and as a participant has a keen interest in the design of the payment systems. The Bank has articulated its high-level expectations to Payments Canada:

- The Bank sees a continued need for high-value, batch retail, and real-time payments retail systems to account for the differing risks associated with various payment flows.
- The Bank requires Payments Canada to develop a risk-based framework to ensure that payments do not inappropriately migrate from the high-value system to batch retail or to real-time retail. This framework should include tools such as payment item value caps.
- The Bank requires risk model flexibility to ensure the design of the system and its implementation takes into consideration the possibility that a system may need to meet higher risk standards in the future associated with a change in designation.
- The Bank seeks a stronger compliance enforcement regime to support enhanced risk management.
- The Bank requires that with the replacement of the existing core settlement system, it would no longer provide a residual guarantee to ensure settlement of payments. As a result, the design of the risk model for Lynx must be one where credit exposure from payment obligations must be fully backed by the financial institutions that are participants in the system. The direct implication is that collateral must fully cover each participant's payments (cover-all) to support certainty of settlement. This will be achieved through a "defaulter-pay system". While different designs consistent with the Payments Canada Roadmap were considered, in the Bank's view a real-time gross settlement (RTGS) system with liquidity saving mechanisms provides for a relatively simpler and internationally well-tested framework.

## 2.3 Access Model

The Vision for the Canadian Payments Ecosystem, guided by the Bank of Canada Risk Standards and the Government of Canada's public policy objectives, calls for open and risk-based access to the payment systems to foster competition and innovation – without compromising safety and soundness. Balancing between these objectives will be essential as eligibility criteria and participation requirements for Payments Canada's modernized systems are reviewed. Further to the policy work that is currently being conducted,

---

<sup>3</sup> Principles for Financial Market Infrastructures - <https://www.bis.org/cpmi/publ/d101a.pdf> - Paragraph 1.18

---

Payments Canada is working closely with the Bank of Canada and Department of Finance to complete the review. The following general assumptions are being used to guide this work.

## General Assumptions

- Payments Canada will continue to carry out its core functions and will not perform the functions of a prudential or consumer protection regulator
- The access model (and related systems designs) and compliance frameworks will fulfill Payments Canada's public policy objectives, and seek to mitigate identified risks and liability considerations of Payments Canada and its members related to more open access
- Detailed, risk-based access policies will be developed based on the nature of the risks in each specific payment system
- Realization of open, risk based access will require action by the federal government, including changes to the Canadian Payments Act and the introduction of an oversight regime for retail payment service providers.

## System Access: Eligibility Criteria versus Participation Requirements

The policy for access to Payments Canada's systems will continue to have two components:

1) **Eligibility Criteria**

Payments Canada will review and establish eligibility criteria for each payment system. These eligibility criteria will define the 'universe' of entities that are eligible applicants to be either a Direct or Indirect Participant in Payments Canada's systems.

2) **Participation Requirements**

For eligible entities to gain and maintain access to a system, they must comply with participation requirements. There will be two sets of participation requirements:

- **Payments Canada Requirements to Access Systems**

Payments Canada will continue to develop financial, operational and technical requirements for participants in each one of its systems.

- **The Bank's Requirements to Access its Infrastructure**

If participation in a Payments Canada system also requires access to the Bank's infrastructure and services (e.g., provision of a settlement account and credit facilities), participants will need to meet the Bank's requirements relating to these services. These requirements will include operational, financial soundness, and technical components specific to this infrastructure. Legal agreements will also be required. These requirements will be distinct from Payments Canada participation requirements, resulting in the Bank continuing to have control on direct participation of entities settling payments in central bank money.

While Payments Canada continues to review and consult on options for a final access policy, access to each system is expected to differ as depicted below. Refer to individual system sections: Description of Lynx (Section 2.4), Description of the RTR (Section 2.5) and Description of SOE (Section 2.6) for further information on system specific access assumptions.

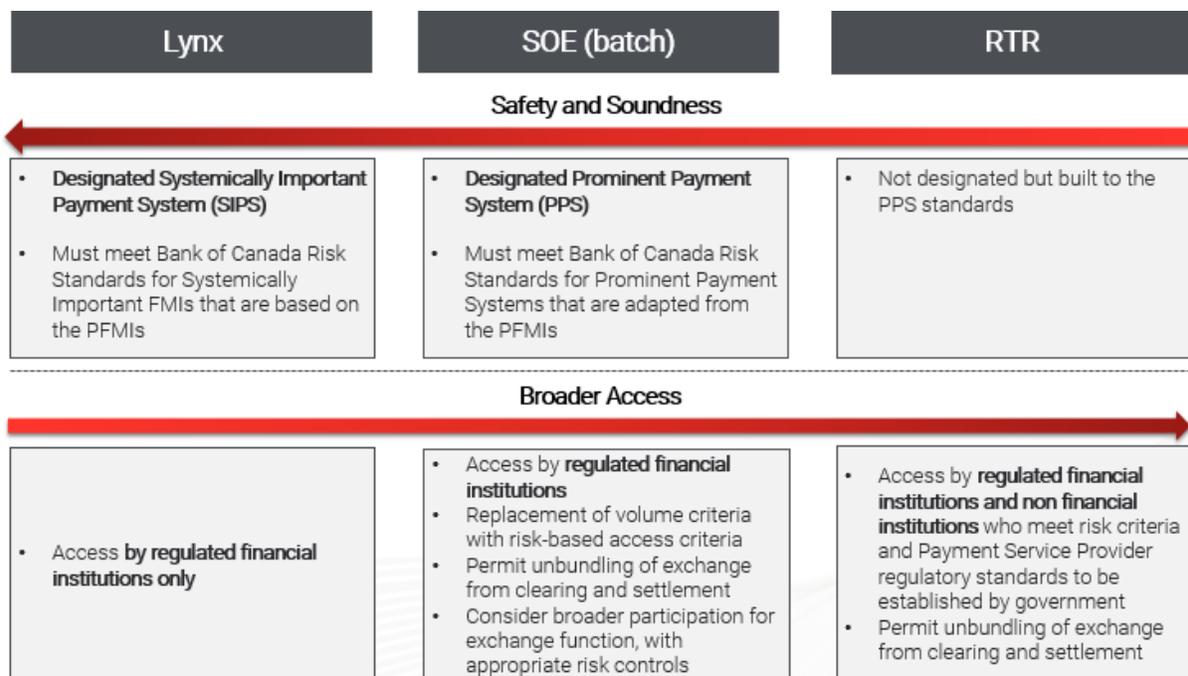


Figure 3: Safety, Soundness and Access Attributes for Lynx, SOE and RTR

## 2.4 High-Value Payment System – Lynx

**Lynx will be the replacement for the LVTS.** The LVTS is Canada’s real-time electronic funds transfer system that provides finality of payment and certainty of settlement. It was implemented in February 1999 and is designated by the Bank as a Systemically Important Payment System (SIPS) under the Payments Clearing and Settlement Act (PCSA) given the value of transactions cleared and settled each day (\$175 billion on average).

As part of the development of the Industry Roadmap and High-Level Plan, Payments Canada undertook a review of the current LVTS application and infrastructure and found that while the LVTS has worked well over the past 17 years, it was designed almost 20 years ago and is not suitable as a long-term foundational platform for large value processing and settlement going forward. An extensive review of options concluded that procuring an application (with enhancements) from a solution vendor is preferable to an entirely custom development of a new solution or an update of the original LVTS application.

As such, Payments Canada has embarked on a competitive dialogue process for the Lynx application. Three potential vendors were invited to the competitive dialogue process, CGI, SIA/Perago, and Vocalink, and through the process each vendor had the opportunity to demonstrate and describe how their proposed solution would meet the needs of the Canadian marketplace. The process also provided an opportunity for Payments Canada and members to explore and refine the requirements for the solution.

Through the replacement of LVTS with Lynx, Payments Canada will achieve the following objectives:

- **Implementation of a modernized high-value clearing and settlement system** that can support Canada’s current and future needs and continues observing the Bank’s regulatory standards for SIPS

- **Implementation of a system with a modern and flexible architecture** which can adapt to future changes in technology and business processes in an effective manner
- Support for easier **and quicker onboarding** of new participants
- **Improved resiliency capabilities**, minimizing reliance on single providers or solutions, including support for rotating data center operations, automated failover and possibly tertiary contingency operations
- **Better/more automated testing facilities** and more efficient change management processes
- **Introduction of Application Program Interfaces (APIs)** or services to integrate with Lynx Participants or other systems (FMIs) requiring settlement
- **Better reporting capabilities** including historical data, liquidity, and queue management.

## Lynx Financial Risk Model

One of the more significant changes in moving from the LVTS to Lynx is the changing financial risk model. In developing the Lynx financial risk model, the objective is to ensure that it will meet the Bank's SIPS Standards in the most efficient and effective way. The financial risk model will encompass risk controls that are intended to mitigate credit and liquidity risk as well as a settlement process that will provide finality of payment and certainty of settlement in central bank money. To achieve this, Lynx will be a real-time gross settlement (RTGS) system and, as such, credit risk exposure in Lynx will be fully covered by its participants and no longer rely on the residual guarantee from the Bank of Canada.

The following table summarizes the requirements of the FMI Standards for credit, liquidity and settlement risk and the Lynx financial risk model attributes which address the requirements:

Requirement	Risk model
<p><b>Credit Risk</b></p> <ul style="list-style-type: none"> <li>• A payment system should provide for the full coverage of each participant's exposure with a high degree of confidence using collateral and other equivalent financial resources (cover-all)</li> </ul>	<p><b>Cover-All Defaulter Pay Model</b></p> <ul style="list-style-type: none"> <li>• Guarantee 100% of the time that each payment is settled in real-time and is fully backed by collateral</li> <li>• Participants pledge to the Bank eligible collateral with a value which provides sufficient liquidity to settle payments at all times</li> </ul> <p><b>RTGS Mechanism</b></p> <ul style="list-style-type: none"> <li>• Provides for the real-time payment finality</li> </ul>
<p><b>Liquidity Risk</b></p> <ul style="list-style-type: none"> <li>• A payment system should provide for sufficient liquid resources in all relevant currencies to affect same-day settlement, and where appropriate intra-day settlement, of payment obligations</li> </ul>	
<p><b>Settlement Risk</b></p> <ul style="list-style-type: none"> <li>• A payment system should complete final settlement no later than the end of the value date, and preferably intraday or in real-time, to reduce settlement risk</li> </ul>	

Figure 4: Lynx Financial Risk Model

---

## Assessing Potential Lynx Solutions

In moving to a new financial risk model and no longer relying on the residual guarantee, the expectation is that the liquidity requirements for Lynx Participants will increase substantially<sup>4</sup>. Therefore, one of the key focus areas in assessing supplier solutions is to consider the type of liquidity management tools that can be leveraged and how efficient they are in helping financial institutions manage their liquidity.

RTGS systems now offer **liquidity savings mechanisms (LSMs)** to help participants reduce liquidity requirements. These mechanisms essentially queue payments, group them, and use algorithms to find other matching payments and then validate the offsetting amount against available liquidity while still settling the gross amount of each payment. Most RTGS systems provide participants with options on how to categorize or prioritize payment messages. This allows more urgent payments to pass risk controls and settle immediately while allowing other payments to be delayed up to a specific time to gain the liquidity efficiencies of offsetting. Equally important to examining the liquidity efficiency of the solutions is understanding the delay times for payments, as moving to Lynx should not materially impact service levels for processing payments.

Given the likelihood of higher liquidity requirements and LSMs to offset these increased costs, Payments Canada has developed a conceptual solution on which the potential suppliers are to base their solution proposal. In the conceptual solution, Lynx Participants will have the option to classify payments as Urgent or Non-urgent. There will be no difference in the finality of both types of payments. Non-urgent Payments will be subject to an LSM to allow for offsetting and reduced liquidity costs, while Urgent Payments will attempt to be processed immediately against allocated liquidity. To further reduce liquidity requirements, Payments Canada is also exploring with vendors whether Urgent Payments can be offset against Non-urgent Payments with minimal settlement latency. Having the ability to determine how each payment is treated, either as an Urgent or Non-urgent Payment, will allow participants to balance the tradeoff between liquidity efficiencies and settlement delay.

As a result of the higher liquidity requirements in an RTGS system, some participants could be tempted to adopt what is known as “free-rider” behavior to acquire and conserve liquidity by not sending payments until they receive payments. This behavior, if left unmitigated, could impact the smooth flow of payments in Lynx, resulting in gridlock, which could have cascading effects on all participants.

In the next few months, Payments Canada will focus on identifying and analyzing mechanisms, both technical and rule-based, as well as differential pricing, that will encourage participants to send payments early in a settlement cycle.

Throughout July - August 2017, Payments Canada conducted a proof-of-concept with each vendor, which included a review of each vendor’s capabilities with respect to LSMs. In parallel, Payments Canada has carried out an examination of other rule-based mechanisms; recommendations will be developed and reviewed with members in 2018. The expectation is that recommendations will ultimately be reflected in the system rules. There will also be tools available in the system to support members and monitor payment flows and use of liquidity. Payments Canada will consider how its compliance program will need to evolve to monitor compliance with any rule-based requirements.

---

<sup>4</sup> Estimates prepared based on 2016/2017 LVTS values suggested that the aggregate cost for all participants could increase between 10% to 74% with an average increase of 42%; the impact on an individual participant would vary based on their current collateral and liquidity management process.

## Lynx Settlement Cycle and Payment Flow

While Payments Canada is still in the midst of procuring the Lynx solution, and the specific offerings of the selected vendor will dictate payment flows and LSMs, Payments Canada and the Bank of Canada have developed a conceptual process flow for the treatment of Lynx payments.

The figure below shows the expected process flow for a payment processed through Lynx:

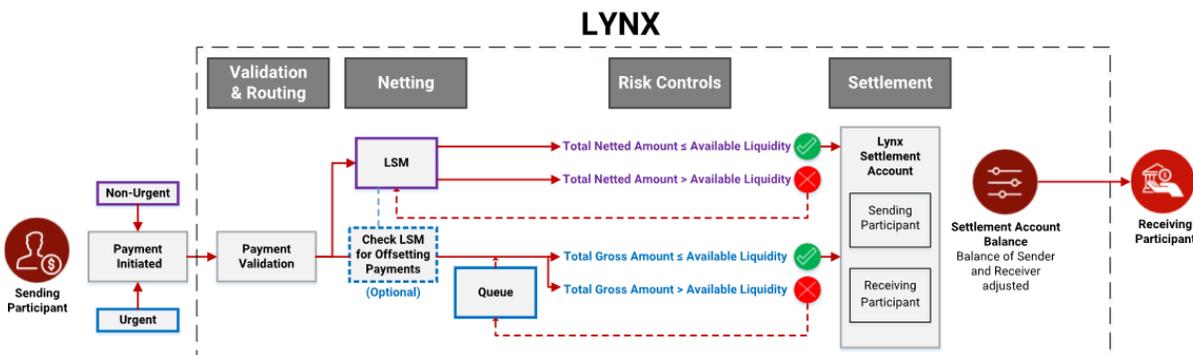


Figure 5: Lynx Payment Process Flow

At the start of each settlement cycle, Lynx Participants will pledge collateral to the Bank via CDSX (central securities depository and securities settlement system) operated by the Canadian Depository for Securities Limited (CDS). The information will be transferred into the Bank's High Availability Banking System (HABS), where the Bank will value the collateral; this valuation will remain in effect for the entire settlement cycle. Lynx Participants will allocate collateral for Lynx within HABS to obtain intra-day cash advances from the Bank. The cash advances will be deposited into their Lynx Deposit Accounts in HABS. The funds will then be moved from their Lynx Deposit Accounts in HABS to their Settlement Accounts in Lynx which will be used during the settlement cycle. The Lynx Settlement Accounts will legally be an account of the Lynx Participant on the books of the Bank.

The balance in each participant's Lynx Settlement Account represents the Lynx Participant's available liquidity for Lynx payment processing. Participants will allocate their balance to Urgent and Non-urgent Payments, with the unallocated remaining balance being excess. At the end of the cycle, any remaining liquidity in the participant's Lynx Settlement Account will be transferred to the participant's Lynx Deposit Account in HABS, such that the participants' Lynx Settlement Accounts will have a balance of zero and the Deposit Account will reflect both the new balance as well as the change from the opening balance. At the opening of the next cycle, any funds in their Deposit Account will be transferred to their Lynx Settlement Account along with the intra-day advance from the pledged collateral. Alternatively, if the participant requested an overnight advance, the participant will send a payment for the corresponding amount to the Bank.

When sending a payment, Lynx Participants can specify the Payment Type as Urgent or Non-urgent with the exception of some payments that must be classified as Urgent for immediate settlement, including payments for settlement of other FMI's (Canadian Derivatives Clearing Corporation, CDS, Continuous Linked Settlement System) and payments to the Bank.

---

Once the payment has been initiated and submitted to Lynx, it is validated against predefined business rules (e.g. value date and currency). If it passes validation, it is routed based on payment type. If it fails validation, it is rejected and sent back to the sending Lynx Participant with a message containing a rejection reason code. The validated payments are then checked against risk controls depending on the payment type:

- **Urgent Payments** will be sent for immediate settlement. In the process, LSMs may, depending on the choice of solution and any customization and configuration, be used to check with minimal latency for offsetting payments (the value of the Urgent Payment must be greater than or equal to the value of the offsetting Non-urgent payments). For each Urgent Payment, or for an Urgent Payment with its offsetting Non-urgent Payment(s), risk controls are then applied to determine if there is sufficient liquidity left allocated to Urgent Payments to be able to proceed. For each Urgent Payment with no offsets, the total gross amount must be less than or equal to the available liquidity; for each Urgent Payment with offsets, the net amount must be less than or equal to the available liquidity. If the payment does not pass these risk controls then it will be placed in a Lynx Participant's Urgent Payment queue and retried when credit is received or for a configurable period of time before it may be rejected, in which case the Lynx Participant will be sent a message containing a rejection reason code.
- **Non-urgent Payments** will be placed in an LSM for netting. These payments are grouped bilaterally or multilaterally and their net value must be less than or equal to the available liquidity (or allocated liquidity for Non-urgent Payments if applicable). Risk controls will ensure that there is sufficient liquidity available to process the payment. If there is insufficient liquidity then the payment will be placed back in the LSM and retried at configurable intervals before it may be rejected, in which case the sending Lynx Participant will be sent a message containing a rejection reason code.

The outcome of this design with the use of LSMs will mean that only Urgent Payments that are not netted will require liquidity dollar-for-dollar, whereas payments that are netted will require liquidity on a net basis even though each payment will be settled on a gross basis.

If payments pass the risk controls, they are considered settled and therefore are final and irrevocable. The sending and receiving Lynx Participants' Settlement Accounts are updated to reflect the new balance. The payment is released to the receiving Lynx Participant for the funds to be credited in the beneficiary's account.

At the end of each settlement cycle, Lynx Participants will have the opportunity to flatten their positions (i.e., have a balance that is near the total cash advance(s) provided by the Bank). After the Lynx Participants' final end of cycle positions are determined, the balance in each Lynx Participant's Settlement Account will be transferred back to the Lynx Participant's Deposit Account at the Bank and the intra-day advances will be repaid. If the end of day balance is less than the total cash advances taken by the participant, there is shortfall in the Lynx Participant's Deposit Account in HABS, an overnight advance would be required at bank rate; whereas, if the end of day balance is greater than the total cash advances, the participant will be in a long position, and the funds would be held on deposit at the Bank and accrue interest at the deposit rate.

Today in the LVTS, multilateral net positions are settled once at the end of the cycle through a debit or credit entry to the settlement account of each LVTS participant. Settlement in Lynx will differ as individual payments to/from a participant are settled on a gross basis continuously during the settlement cycle (typically a business day) by means of one debit or credit entry to the Lynx Settlement Account of each

---

participant, which represents the Bank's intra-day book of record. The move from LVTS, a model with credit limits, to Lynx, an RTGS model, will require Lynx Participants' liquidity to always be positive – i.e. Lynx Participants will not be able to be in a “multilateral net debit position” at any time.

## Phased Approach

In considering the functionality that Lynx must deliver, there is a need to differentiate between functionality that is required for the initial implementation of the new system, and functionality that will only be required as the payment system evolves. As such, in order to design the system for initial implementation, ease of adoption, and appropriately future proof the system, a phased approach is being taken.

- **Phase I** – This phase will see the implementation of a new application with a new risk model, collateral and liquidity management processes, system monitoring and user interface. The technical architecture and security posture will also be upgraded. Lynx will continue to process SWIFT MT payment messages.
- **Future Phases** – In future phases, Lynx Participants will migrate to MX (ISO 20022) payment messages, Lynx will have the ability to warehouse future dated payments, and consideration will be given to extending the hours of operation.

While Lynx functionality will be introduced through different phases, it is important to note that as Payments Canada procures the Lynx solution, the expectation is that all functionality that is deemed mandatory, regardless of when the functionality will be introduced, must be delivered as part of initial development. For functionality that is only required for future phases, Payments Canada will collaborate with participants and the selected supplier to determine when and how best to introduce this functionality.

## Assumptions on Access to Lynx

Access criteria and participation requirements for Lynx are likely to remain consistent with those currently in place for the LVTS, given Lynx will replace the LVTS and be designated by the Bank as a Systemically Important Payment System. However, as mentioned in Section 2.9, policy analysis is being conducted and until that work is complete, decisions on access to Lynx are not finalized.

## 2.5 Real-Time Rail (RTR)

The Vision for the Canadian Payments Ecosystem identified the need for a new, robust payments option that would allow funds to be immediately available to recipients. To address this need, in the Modernization Industry Roadmap and High-Level Plan, Payments Canada announced its intention to develop a faster payments capability in the form of a real-time payment system.

The RTR will be a **new capability** for Canada, operating 24/7/365, and will deliver funds in real time using a push mechanism for single credit transfers. The RTR will be built to support ISO 20022 messaging, allowing for rich remittance data that flows with the payment. The RTR will likewise support the development of overlay services – new offerings built atop the system's core infrastructure – and thus serve as a platform of innovation for new consumer, commercial, and government payment services. Payments Canada, as the system operator, will set the overarching policies and rules for the RTR including

the access criteria, pricing, the risk model, rules and procedures, as well other standards and governance considerations.

The RTR will be built with modular technical architecture, allowing for innovative new capabilities and services to be added in response to regulatory developments, market needs, and demands for broader access. Payments Canada will continue to work closely with the ecosystem at large to ensure the system is 'fit-for-purpose' and serves as an innovation platform for payments in Canada.

## Scope of RTR

RTR consists of payment execution capabilities via a two-tier functional architecture: a real-time payment system and overlay services. The RTR will consist of the underlying technology platform and infrastructure that represents the payment system itself. The system includes all core payment functionalities (connectivity, exchange, clearing, and settlement) as well as key enablers (e.g., rules and procedures, messaging management for ISO 20022).

Overlay services consist of customer-facing products, services, and capabilities developed by participating Payment Service Providers (PSP), that connect to the system for the real-time exchange of payments. Overlay services will connect to the RTR through Application Program Interfaces (APIs), providing an accessible and scalable connectivity mechanism that facilitates innovation.

In conjunction with the system and overlay services, Payments Canada will also manage the overarching policy and legal framework surrounding the RTR. This policy and legal framework includes system access, risk and settlement models, rules, procedures, standards and governance.

The graphic below (Figure 6) illustrates the RTR functional architecture, the scope of the RTR and overlay services, as well as the surrounding policy framework.

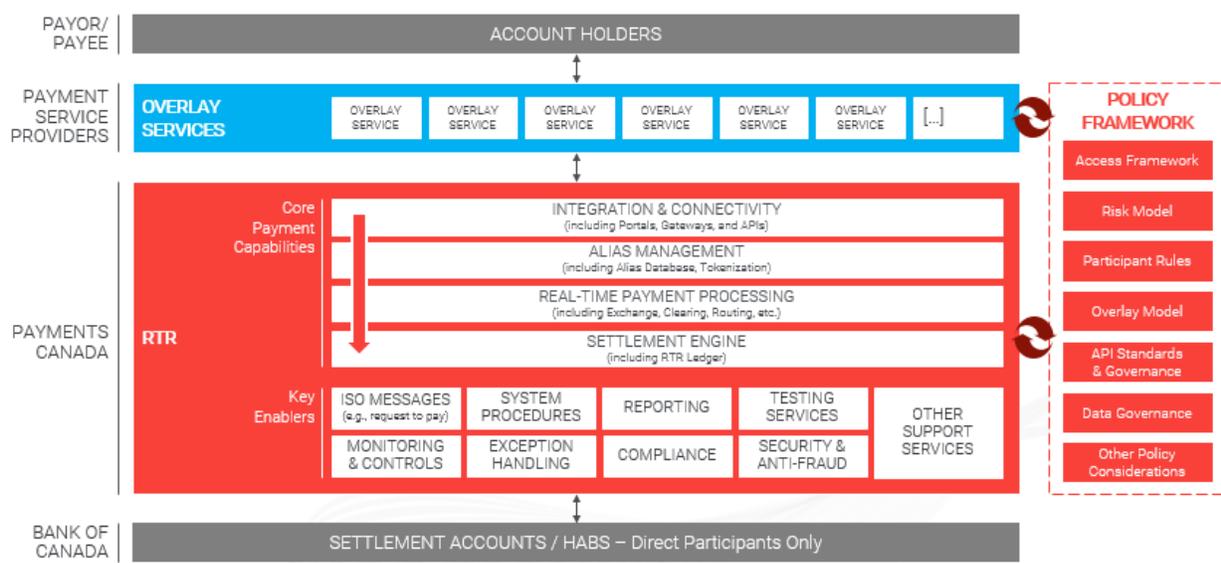


Figure 6: RTR Functional Architecture and Scope

The RTR will consist of multiple components that function together to enable participating PSPs to offer real-time payments capabilities. It will provide:

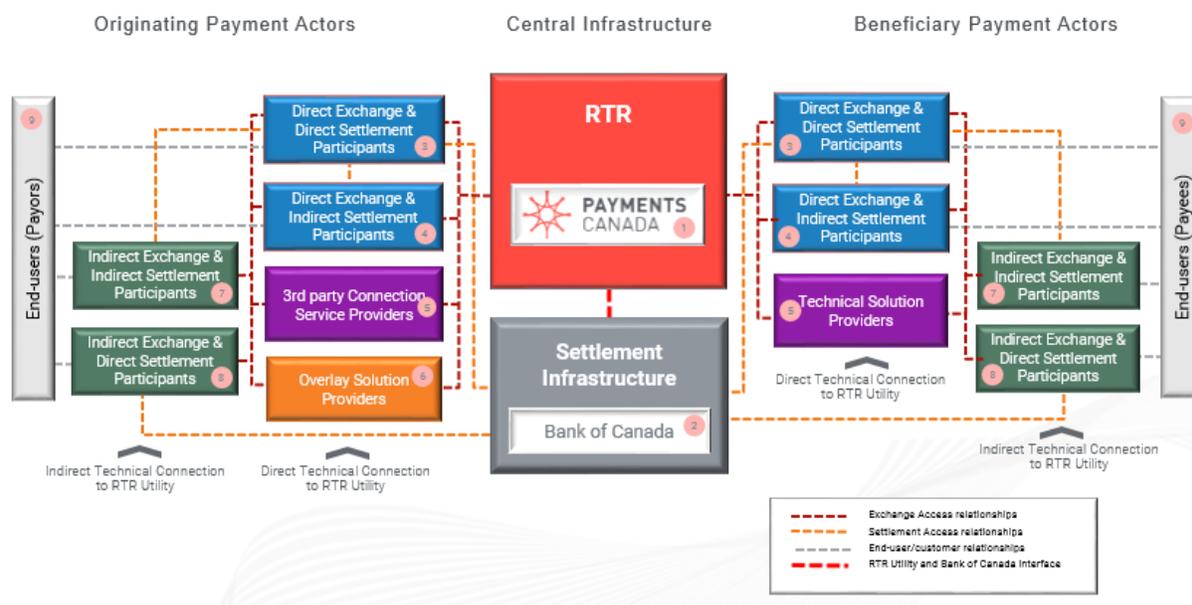
- (i) instant and irrevocable exchange and clearing of single credit transfer payment items with a robust risk model and;
- (ii) shared services that support exchange and clearing, with the initial shared service being an alias database.

Payments on the RTR may be originated either using an approved alias (e.g., email address, mobile number, or other unique aliases) or an actual PSP routing and payment account number. Participants will offer overlay payment services directly to their customers, which can include solutions offered by third-party solution providers. Access to these services will be managed at the system level, which will be operated and governed by Payments Canada.

Participants may choose to be an Originating Participant (“Send”) by offering one or more overlay payment services to their customers for originating real-time payments. All participants must be a Beneficiary Participant (“Receive”) in that they must have the capability to receive on behalf of their customers all real-time payments that are sent from any overlay payment service. Connectivity to the RTR, for both Originating and Beneficiary Participants, must support the ISO 20022 messaging standard.

## RTR Ecosystem

The RTR ecosystem is shown in the graphics below (Figure 7) which depict the various ecosystem actors, the technical connection and other relationships between them in respect to the RTR.



**Figure 7: RTR Ecosystem - Relationship Map**

The ecosystem includes Payments Canada (owner and operator of the RTR), the Bank of Canada (the provider of the Settlement Accounts and supporting infrastructure), participants that connect to the system

and provide overlay services to customers, and other ancillary entities such as providers of overlay solutions or technical solutions.

Roles & Relationships	
1 Payments Canada	Owner and operator of RTR
2 Bank of Canada	Provider of infrastructure and services to enable the settlement of real-time payments
3 Direct Exchange & Direct Settlement Participant	A Participant that has direct exchange and settlement access. May also act as a Connection Service Provider (CSP) to Indirect Exchange Participants and/or a Settlement Agent to Indirect Settlement Participants.
4 Direct Exchange & Indirect Settlement Participant	A Participant that has direct exchange and indirect settlement access. May also act as a CSP to Indirect Exchange Participants, and must use a Settlement Agent for settlement access.
5 Technical Solution Provider	Connection Service Provider - An entity that has direct exchange access to RTR and connects one or more Indirect Exchange Participants
6 Overlay Solution Provider	A third party that provides an approved overlay payment service to Participants and their customers. May have direct technical access to RTR for submitting payments on behalf of Participants and act as a CSP.
7 Indirect Exchange & Indirect Settlement Participant	A Participant that has exchange access through a CSP and settlement access through a Settlement Agent.
8 Indirect Exchange & Direct Settlement Participant	A Participant that has indirect exchange and direct settlement access. They use a CSP for exchange access, and may act as a Settlement Agent to Indirect Settlement Participants.
9 End-users	Customers (consumers, businesses, governments, etc.) of Participants that hold payment accounts used for sending and/or receiving payments.

Figure 8: RTR Ecosystem - Roles and Relationships

## Access Assumptions for RTR

The RTR is expected to have the broadest access criteria of all three systems, while maintaining a robust and prudent risk management framework. The access model for the RTR will be developed in consideration of the Retail Payments Oversight Framework (currently being developed by the Government of Canada). This framework seeks to establish risk and oversight requirements that would apply to all retail PSPs not currently subject to comprehensive oversight. Payments Canada intends to employ the new oversight framework in establishing access criteria for participation for the RTR. Consequently, in the application of the framework, there is an expectation that PSPs (which would include some non-prudentially regulated entities) will be able to participate in the system.

Participants will require technical connectivity to the RTR in order to exchange and clear payments on behalf of their customers. Connectivity can be direct or indirect through an entity providing connection services. Participants will also require access to settlement services with the Bank of Canada to effect settlement finality. Settlement access can be direct or indirect (i.e., through a Settlement Agent).

The ecosystem figure (Figure 9) depicts the various roles that participants may have in respect to the RTR. In addition to offering payment services to end-users, if they connect directly to the system, they may act as a Connection Services Provider to other participants. If they have direct settlement access, they may also act as a Settlement Agent to other participants.

Participation Models	Exchange Payments Directly	May Exchange for Others	Exchange Payments via CSP	Settles Own Payments	May Settle for Others	Settles via Settlement Agent
Direct Exchange & Direct Settlement Participant	✓	✓		✓	✓	
Direct Exchange & Indirect Settlement Participant	✓	✓				✓
Indirect Exchange & Direct Settlement Participant			✓	✓	✓	
Indirect Exchange & Indirect Settlement Participant			✓			✓

Figure 9: Capabilities by Participation Level

## RTR Risk and Settlement Model

Different models have been developed that enable the participation of new payment service providers and these models are presented below. Two categories of participants are considered (i) Category 1, composed of prudentially regulated entities and (ii) Category 2, composed of non-prudentially regulated entities. The RTR will employ a 'cover-all' defaulter pay risk model. Discussion is ongoing with members, stakeholders, and the Bank of Canada, and the model is expected to be finalized in Q1 2018.

	Settlement Mechanism	Financial Risk Model	Credit Risk Coverage
<b>Deferred Net Settlement Model</b>	Exchange of payment items to occur on a real-time and continuous basis (24/7), and the settlement of those payment items to occur on a deferred multilateral net basis at end of each defined payment exchange cycle.	<p><b>Two options to address credit risk:</b></p> <ol style="list-style-type: none"> <li>1. Pledge collateral to the Bank of Canada to affect settlement in the event of a default. Additional liquidity is required to affect daily settlement (available only to Category 1 participants); or</li> <li>2. Prefunding cash set aside to affect daily settlement (available to both Category 1 &amp; 2 participants).</li> </ol> <p><b>Two categories of participants:</b></p> <ul style="list-style-type: none"> <li>• Category 1 – prudentially regulated entities</li> <li>• Category 2 – non-prudentially regulated entities</li> </ul>	<ol style="list-style-type: none"> <li>1. For pledge of collateral, two options for default pool:               <ol style="list-style-type: none"> <li>a) cover-all defaulter pay model; or</li> <li>b) less than cover-all (defaulter pay model + loss sharing arrangements)</li> </ol> <p><i>NOTE: The Bank of Canada has indicated that it supports a <b>cover-all settlement model</b> that would facilitate broad access to RTR.</i></p> </li> <li>2. For prefunding cash, it would provide for cover-all defaulter pay</li> </ol>
<b>Pre-Funded Real-Time Settlement Model</b>	Settlement of each payment item to occur at the same time as payment exchange, on a continuous, real-time basis.	Settlement funds are fully pre-funded to affect real-time settlement, which would guarantee finality of each payment	By definition no credit risk exposure (credit risk fully covered), provides for cover-all defaulter pay model

Figure 10: Risk and Settlement Model

---

## 2.6 Batch System - SOE

**The Settlement Optimization Engine (SOE) will replace ACSS.** The Automated Clearing Settlement System (ACSS) is a batch total entry system, built in 1984, that supports the clearing of batch payments including Automated Banking Machine (ABM) debit transactions and adjustments, Point of Sale (POS) and online payments and refunds, electronic funds transfers (AFT debits and credits, Electronic Data Interchange (EDI), and Government Direct Deposits), paper items<sup>5</sup>, and image captured payment items and returns. Currently, Direct Clearers exchange payment items bilaterally outside of the ACSS throughout the day, make separate manual entries of batch totals into their individual back-office ACSS terminals, and the ACSS calculates multilateral or bilateral net positions, as appropriate, for settlement the next day. The ACSS currently operates using a tiered structure where Direct Clearers provide services to Indirect Clearers. Indirect Clearers typically experience an additional one or two-day delay for ACSS transactions to be processed. This additional time can create risk (and expense) for Indirect Clearers and can place them at a competitive disadvantage relative to Direct Clearers.

**ACSS was designated as a Prominent Payment System (PPS)** by the Bank in May 2016. ACSS does not meet several of the PPS Standards, including same-day settlement, open risk-based access and credit risk management<sup>6</sup>. In addition to driving ACSS system upgrades, the PPS designation will have impacts on all Direct Clearers (in particular, the shift to same-day settlement and collateralization requirements).

**SOE is intended to replace the ACSS<sup>7</sup>,** clear the same payment streams, and address the PPS requirements. Payments Canada examined the ACSS and concluded that, while the core attributes and the efficiencies realized by the ACSS should be maintained, enhancements were required to meet the regulatory objectives and deliver new features such as centralized exchange and enhanced risk monitoring and management. The lack of automation, outdated technology, and limited functionality in the ACSS makes modifications challenging: any change requires coordination across all 12 Direct Clearers and will have secondary impacts on Indirect Clearers.

### Phased Approach

The three-phased approach described below illustrates one potential option and represents what is known at the time of writing this document. The target end state for SOE and the definition of the phases are still being reviewed, with regular inputs from the Bank of Canada and members. The Bank has defined three key regulatory objectives for the delivery of SOE that are anchored in the risk management requirements for PPS:

- **Prevention of Inappropriate Payments Migration from Lynx** - Payments Canada must develop a risk-based framework to prevent high-value payments migrating from Lynx, a SIPS, to SOE, a PPS

---

<sup>5</sup> Paper items include cheques, Canada Savings Bonds, paper based remittances, Receiver General Warrants, Treasury Bills and old-style bonds, and unqualified paper payment items that do not meet CPA requirements for a qualified item, as well as MICR encoded paper items that are rejected.

<sup>6</sup> Payments Canada is implementing an Interim Credit Risk Model for ACSS, which will require Direct Clearers to pledge collateral ex ante that will cover the credit exposure from the default of the largest participant. Payments Canada expects the interim model will become effective in Q1-2018 when the regulatory process for the associated by-laws and rules are completed.

<sup>7</sup> SOE will also replace USBE.

- **Robust Risk Management** - Payments Canada must have the ability to effectively measure participants' credit exposure throughout the day, so credit risk in the system can be monitored in real-time throughout the settlement cycle. Risk related to tiering must also be monitored, and a compliance framework must support this risk management.
- **Access** - SOE should facilitate fair, open, risk-based access which could lead to greater direct participation in SOE.

Payments Canada has outlined a three-phased approach with the intention to deliver a new technology platform in Phase I, to meet all the Bank's requirements in Phase II, and to have a fully centralized model in Phase III, while minimizing the impact on existing members by staggering required changes across all three phases.

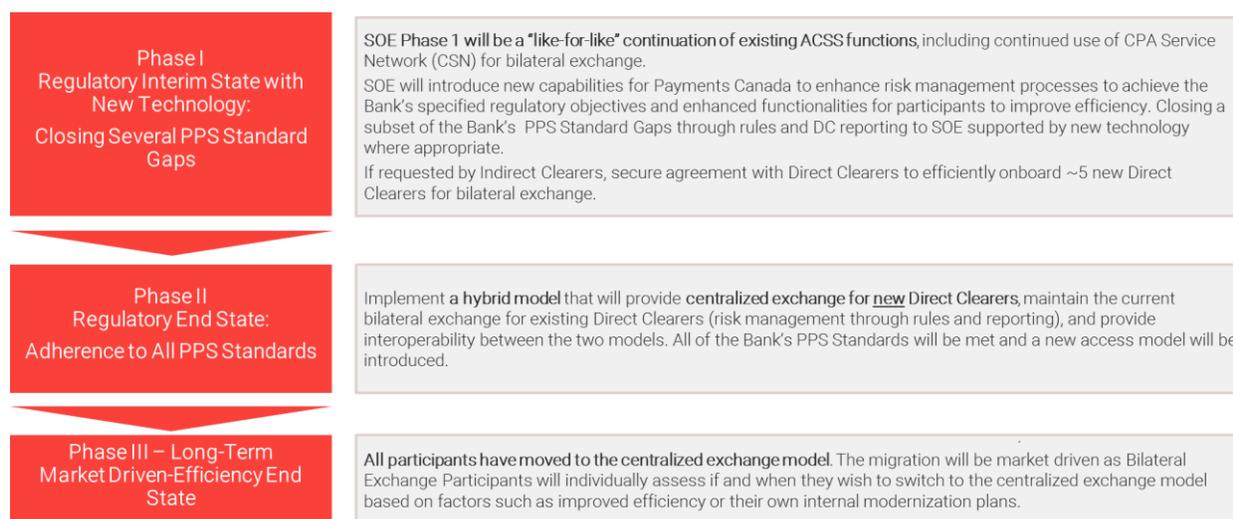


Figure 11: Phasing of SOE Release

### Phase I - Regulatory Interim State

The focus of Phase I is to have minimal impact on the financial institutions. For initial go-live, SOE will:

- 1) Mirror existing ACSS and USBE processes and functionality
- 2) Introduce enhanced functionalities for participants to improve efficiency of existing processes and new functionalities for Payments Canada to enhance risk management processes to meet the Bank's PPS Standards
- 3) Continue to leverage the CPA Service Network (CSN) for the bilateral exchange of AFT, EDI and image files
- 4) Implement a defined Service Level Agreement to onboard new participants in the bilateral exchange (i.e. if a financial institution wanted to become a Direct Clearer all incumbents would need to adhere to defined timelines to on-board them).

### Phase II - Regulatory End State

Phase II, the Regulatory End State, includes two separate and distinct deliverables. A hybrid exchange model would be introduced for the centralized exchange of AFT (and potentially

---

EDI and cheque image) files for new Direct Clearers while maintaining bilateral exchange for existing Direct Clearers. In addition, Phase II would meet all of the Bank's PPS Standards including same-day settlement and enhancements to the ACSS Interim Credit Risk Model.

As part of Phase II, SOE would:

- 1) **Provide centralized exchange for new Direct Clearers** (Centralized Exchange Participants) and maintain the current bilateral exchange for existing Direct Clearers (Bilateral Exchange Participants), as well as interoperability between the two exchange models:
  - a) Bilateral Exchange Participants will assemble a batch file in Bilateral Exchange Format (containing only payment items for one Direct Clearer)
  - b) Centralized Exchange Participants will assemble a batch file in Centralized Exchange Format (containing payment items for multiple Direct Clearers)
- 2) **Be configured as a concentration node to connect Bilateral Exchange Participants with Centralized Exchange Participants**
  - a) Payment items from Centralized Exchange Participants to Bilateral Exchange Participants will be assembled by SOE and sent in the Bilateral Exchange Format (single file per participant)
  - b) Payment items from Bilateral Exchange Participants to Centralized Exchange Participants will be assembled and sent in the Centralized Exchange Format (receiving a single file from the SOE)
  - c) Payment items exchanged between Centralized Exchange Participants will be assembled and sent in the Centralized Exchange Format (submitting and receiving a single file to and from the SOE)
  - d) Payment items (batch files) between Bilateral Exchange Participants will be exchanged on a bilateral basis
- 3) **Adhere to all Bank of Canada PPS Standards**
  - a) Adherence to all the Bank's PPS Standards
  - b) Closing remaining gaps in Standard 4 and Standard 6 – Credit and Liquidity Risk: Update interim credit risk model
  - c) Closing gap in Standard 7 – Settlement Finality: Same-Day Settlement
  - d) Closing gap in Standard 13 – Access: Unbundling payment streams and exchange, updating participant requirements

**Message Format:** For AFT items subject to centralized exchange, Bilateral Exchange Participants would use an ISO 20022 message assembled in Bilateral Exchange Format (contains only payment items for/from one Direct Participant). Centralized Exchange Participants would use the same ISO 20022 message assembled in Centralized Exchange Format (contains payment items for/from multiple Direct Clearers). Based on the timeline, it is important to note that if SOE Phase II is implemented before ISO 20022 is introduced for AFT, SOE will support both standard 005 and ISO 20022 message formats. Should centralized exchange also be introduced for the exchange of EDI and cheque image files, the SOE will also support ANSI X12 and ANSI X9, respectively.

**Exchange and Routing:** If a message (batch file) is exchanged between two Bilateral Exchange Participants, it would be exchanged bilaterally as it is today without any intervention from the SOE. If a message is exchanged between two Centralized Exchange Participants, SOE will parse, sort, and assemble the

---

message in the Centralized Exchange Format, prior to sending it to the receiving participants. If a message is exchanged between Bilateral and Centralized Exchange Participants, SOE will parse, sort and assemble the message in the format that corresponds to the receiving participant. Payment items from multiple messages and Direct Clearers will be consolidated before they are assembled and routed; however, this will not apply to messages that are exchanged between Bilateral Exchange Participants.

**Risk Management Tools:** Risk management tools will be implemented to allow Payments Canada to measure, monitor and manage risk within the system. There are various ways that risk management tools can be implemented, either ex-ante or real-time, and Payments Canada will examine the most effective and efficient way to implement the tools in order to adhere to the PPS Standards and the Bank's risk management requirements, while minimizing impact on Direct Clearers. In addition to the risk management tools, enhancements to the compliance program will be considered.

**PPS Compliance:** Phase II will ensure that SOE meets all the Bank's requirements for PPS, including same-day settlement, although it is expected that certain paper items and AFT payments that are exchanged in the 9 pm ET window may settle the next day. The SOE will also collect aggregate payment information for both Direct and Indirect Clearers to meet the tiered participation risk standard of the Bank.

### **Phase III - Final End State**

Phase III would see all participants migrate to the centralized exchange model. The migration would be market driven as Bilateral Exchange Participants will individually assess, if and when, they wish to switch to the centralized exchange model based on factors such as improved efficiency or their own internal modernization plans. The current bilateral exchange model will be retained for other payments streams (e.g., cheques) that are not subject to centralized exchange.

At present, there is no regulatory requirement or planned timeline to mandate a move to Phase III.

### **SOE Settlement Process**

Direct Clearers will settle their SOE obligations by making a Lynx payment at the Bank (in HABS) to their respective SOE Settlement Accounts, which are separate from the participants' Lynx Settlement Accounts. SOE Direct Clearers will need an SOE Settlement Account at the Bank but will not need to be Direct Clearers in Lynx. SOE Direct Clearers who do not participate in Lynx can have a contracted financial institution make a Lynx payment from said bank's account at the contracted financial institution to their SOE Settlement Account at the Bank. The SOE Direct Clearer's financial institution uses its own Lynx liquidity for that payment, and manages its risk by making a book transfer to take the cash from the SOE Direct Clearer's bank account first. Alternatively, the financial institution could have a commercial collateral arrangement with its SOE Direct Clearer to manage the risk related to the Lynx payments.

At the end of each cycle the SOE calculates multilateral net positions (MNPs) and communicates them to:

- HABS, so the Bank knows what payments to expect. Those participants in multilateral net debit positions (MNDP) need to make Lynx payments to their account, those with multilateral net credit positions (MNCP) will receive Lynx payments from the Bank.

- All SOE Direct Clearers in MNDP know the amount of the Lynx payment they need to make for settlement and those in MNCP know how much to expect from the Bank

Each SOE Direct Clearer with MNDP initiates a Lynx payment from their bank account to their SOE Settlement Account. Once all funds are received from SOE Direct Clearers in a MNDP, the Bank initiates Lynx payments to those SOE Direct Clearers with MNCP.

After SOE Direct Clearers with MNCPs have received Payment via Lynx, all obligations have been settled and the settlement cycle is considered final.

## SOE Financial Risk Model

The SOE risk model is intended to address payment system risk, as SOE is a payment system that the Bank considers critical for economic activity in Canada. It must meet the Bank’s PPS Standards. Like the Lynx risk model, the SOE risk model also includes the following elements:

- Risk controls that are intended to mitigate credit and liquidity risk (financial risks)
- A settlement process that provides certain and final settlement in central bank money

The SOE will need to continue to meet the “Cover-1” requirement for credit risk; in other words, there should be sufficient ex ante resources to cover the default of the largest participant at a high level of confidence. In addition, the design will need to be flexible enough to accommodate changes to the risk model<sup>8</sup>. As per the Bank’s objectives Payments Canada will examine pricing incentives and limits on the value of individual payment items that settle through SOE to prevent inappropriate migration of high-value items from Lynx to SOE.

In developing the SOE financial risk model the objective was to ensure that it would meet the Bank’s PPS Standards in the most efficient and effective way possible. Like the Lynx financial risk model, the SOE financial risk model includes the following elements:

Requirement	Risk Model
<p><b>Credit Risk</b></p> <ul style="list-style-type: none"> <li>• A payment system should fully cover the single largest credit exposure with a high degree of confidence using collateral and/or other equivalent financial resources (Cover-1)</li> </ul> <p><b>Liquidity Risk</b></p> <ul style="list-style-type: none"> <li>• A payment system should provide for sufficient liquid resources in all relevant currencies to affect same-day settlement, and where appropriate intra-day settlement of payment obligations</li> </ul> <p><b>Settlement Risk</b></p> <ul style="list-style-type: none"> <li>• A payment system should complete final settlement no later than the end of the value date, and preferably intra-day or in real-time</li> </ul>	<p><b>Cover-1 Survivor Pay Model</b></p> <ul style="list-style-type: none"> <li>• Participants pledge to the Bank eligible collateral with a value which provides sufficient liquidity to cover the default of the participant and its affiliates that would generate the largest aggregate credit exposure (Cover-1) at a minimum 97% confidence level</li> <li>• In the event of a default, first the collateral resources of the defaulter will be used to obtain a loan from the Bank to cover the default amount. Next, the collateral resources of the survivors will be used to determine their default contribution to cover the remaining shortfall based on their exposure to the defaulter on the day of the default.</li> </ul> <p><b>Deferred Net Settlement Mechanism</b></p> <ul style="list-style-type: none"> <li>• Provides for settlement finality by the end of value date</li> </ul>

Figure 12: SOE Risk Model Requirements

<sup>8</sup> Payments Canada expects that its remits and rules will continue to provide for the collection of additional contributions from surviving Direct Clearers if the collateral pool is not sufficient to cover any shortfall from a default or multiple defaults.

---

In summary, the Risk Model for SOE will still be a Deferred Net Settlement (DNS) design and will provide for a “Cover-1” mechanism at a minimum 97% confidence level.

## **Closing PPS Standard Gaps**

As part of the modernization of ACSS, Payments Canada will ensure that SOE will fully meet all the PPS Standards. The PPS Standard that will have the most significant impact on participants is the same-day settlement requirement, meaning payments must settle no later than the end of the value day. The ACSS does not currently meet this standard as payments settle the next day. The duration between payment value day to settlement will impact the amount of credit risk to participants and the system, and potentially impact the risk model. Payments Canada is currently analyzing what the appropriate settlement times should be and whether it is possible for some payment streams (such as paper) to settle same day.

## **Changes Prior to SOE Go-live: ACSS Interim Credit Risk Model**

ACSS is a deferred net settlement (DNS) system and is currently uncollateralized. In the event of a default, members who have exposure to the defaulter on the day of the default are required to make an additional contribution to affect the settlement of the defaulter’s obligation. The amount of the additional contribution for each Direct Clearer is based on the proportion of its exposure to the defaulter. This arrangement does not meet the standard on credit risk, which requires a PPS to maintain collateral ex ante to cover the largest credit exposure.

While SOE is being developed, Payments Canada is in the process of implementing an Interim Credit Risk Model for ACSS. This interim credit risk model will be revisited for SOE considering the need to meet the same-day settlement requirement, the need for intra-day monitoring and potential new access models that could change the amount of credit risk within the new system.

## **Assumptions on Access to SOE**

Eligibility criteria and participation requirements will reflect SOE’s status as a replacement for ACSS, which will be designated as a Prominent Payment System (PPS). Currently, Payments Canada requires that, to be eligible to become a Direct Clearer in the ACSS, a member’s payment volume must be at least 0.5% of total ACSS volume. Over time, this has served as a proxy for ensuring that Direct Clearers in the ACSS have a certain level of financial and operational soundness and efficiency. However, this participation requirement does not fit with the spirit of Principle 18 of the PFMI, and it will be replaced (in function) by new risk-based requirements for obtaining an SOE Settlement Account in HABS. The access review will also potentially lead to the separation of participation in the exchange of payments from their clearing and settlement, giving members more options for how they participate in SOE. Providing members with choice regarding direct participation in the exchange of payments by stream is another option that will require careful analysis, given the desire to allow more open access but also protect the ubiquity of payment streams and the safety and soundness, and the efficiency of the batch payment system.

---

## 2.7 Batch Payment Stream: Enhance Automated Funds Transfer (AFT)

Automated Funds Transfer (AFT) payments are electronic direct credit or direct debit transactions used to move funds between accounts held at two different financial institutions. These are commonly known in Canada as direct deposits or pre-authorized debits (PADs) and are cleared through the ACSS. In 2016, over 1.7 billion AFT credits and debits worth about \$3 trillion were cleared, representing over 40 per cent of the total value of retail batch payments cleared through the ACSS.

### AFT Enhancements Objective

The goal of AFT Enhancement Initiative is to modify the existing AFT batch system to respond to user needs and deliver tangible value to the market as soon as possible while maintaining appropriate risk controls.

Payments Canada's overarching policy objectives for the improvements to AFT are to:

- Ensure a more uniform experience for Canadians across all time zones
- Ensure that funds are made available as fast as possible for most AFT credits.

These goals and objectives will be met over the course of several phases of work which will improve the AFT batch system through the addition of more inter-financial institution exchange times, faster funds availability for beneficiaries, and mandating the use of ISO 20022 payment messages.

- **Phase I:** move to 3 daily exchange deadlines in September 2018 and ensure that funds availability to payees is made within 2 hours of the exchange deadline as of October 2018
- **Phase II:** mandate the use of ISO 20022 payment messages for AFT transactions, following a period of voluntary deployment. The Standard 005, the current messaging standard for AFT transactions, is expected to be repealed in 2021, with a firm date to be confirmed once the ISO 20022 business requirements have been completed in 2018.

### Phase I

The origination process for AFT credits and debits will remain largely the same following the implementation of Phase I. There will be a new Financial Institutions File (FIF) serviceability code that originators will need to be aware of; the new serviceability code 0 (code 0) will identify branches that can provide funds availability for AFT credits received on the due date. All Direct Clearer branches will carry the new serviceability code and Indirect Clearer branches may do so at their discretion.

In September 2018, the two current AFT exchange deadlines will be supplemented with the addition of a 9pm (ET) exchange.

All Direct Clearers will be required to have the capability of receiving multiple AFT files at each of the exchange deadlines (9:30am; 4:30pm and 9:00pm). Direct Clearers may choose whether they will deliver files in all the available exchange deadlines.

---

Direct Clearers that act as Clearing Agents will be required to make AFT credit transactions destined to Indirect Clearer serviceability code 0 branches available to them as soon as possible, but no later than 2 hours following each of the daily exchange deadlines. This new deadline will be known as the “IC Deadline”. Within each of the exchanges, Direct Clearers may receive AFT same-day debits, AFT same-day credits and AFT future dated credits (same-day transactions are credits or debits that are exchanged on or after the due date). AFT same-day debits and AFT future dated credits will be handled as they are today. Same-day credits will be handled as follows: where the beneficiary branch is a Direct Clearer, funds must be made available within 2 hours of the exchange deadline that the transaction was received; where the beneficiary branch is an Indirect Clearer with a serviceability code 0, funds must be made available within 2 hours of the IC Deadline in which the transaction was received; and where the beneficiary branch is a serviceability code 1 or 2, that same-day credit will be considered to have been delivered late, and funds availability must be provided by opening of business on the following business day (for a serviceability code 1) or by opening of business in 2 business days (for a serviceability code 2).

Any branch in Canada that is a serviceability code 0 will still be able to receive credits in advance of the due date, and will provide funds availability at the opening of business on the due date for those credits, as today. Further, Direct Clearers who receive credit instructions from their originators (clients or Indirect Clearers) prior to due date, should continue to exchange those credits prior to the due date, even if they are destined to serviceability code 0 branches. This is intended to prevent some customers from receiving funds availability for scheduled credits, such as payroll, later than they do currently.

## Phase II

Phase II of the AFT Enhancements initiative will require that Direct Clearers develop the ability to send and receive Canadian and U.S. dollar AFT Credit and Debit Transactions using ISO 20022 message formats. Indirect Clearers will not be required to be ISO-enabled, but should they choose to do so, they will be required to register their intent with Payments Canada and comply with the requirements outlined in the ISO AFT Rules. Direct Clearers will be required to provide AFT Files using ISO AFT formats to these participating Indirect Clearers. Non-participating Indirect Clearers would receive applicable remittance information from their Clearing Agents in a mutually agreed upon manner.

ISO 20022 provides the ability to include additional payment information to travel with the AFT transaction to the Remittance Beneficiary of the payment. The ISO AFT Rules allow for the Payment Originator to provide this type of information in three different ways for each transaction:

- 1 repetition of unstructured remittance information (140 characters of free text)
- 100,000 repetitions of structured remittance information details (that allows the Payment originator to detail information related to up to 100,000 invoices being paid in one AFT payment)
- 1 repetition of Related Remittance Information (where the payment originator can indicate the locations where the remittance information could be found by the beneficiary)

Given the significant amount of information that could be contained within the ISO AFT Payment, especially where that information could be considered personal or sensitive information, members will be required to ensure that the environments creating, processing, transmitting and storing ISO AFT transactions adhere to the security provisions provided within CPA Standard 018 – Payment Item Information Security Standard.

---

With respect to the delivery of remittance information, an essential part of the ISO AFT environment, Direct Clearers and Indirect Clearers exchanging ISO 20022 files will be required to pass along any remittance data, if provided, unaltered to the next financial institution in the payment chain or the end users as provided within the rules. The requirements related to the delivery of the remittance information are as follows:

- Unstructured remittance information will be required to be delivered to the end user (remittance beneficiary) as soon as possible but no later than the next business day
- Extended remittance (i.e., all other optional element) shall be delivered to the remittance beneficiary as soon as possible but no later than the next business day, where an agreement to do so already exists or upon request
- Participating members will also be required to fulfil such requests for the extended remittance information as part of their internal investigations procedures (tracing)

As part of Phase II, a new notification process will be added to the AFT environment to allow Direct Clearers to provide notice of receipt of AFT files.

## 2.8 ISO 20022 Strategy

The adoption of an ISO 20022 standard for Canada's payment systems is a necessary condition for the development and implementation of modernized national payment systems that can interface with global standards. As such, Payments Canada's strategy for ISO 20022 includes adoption within AFT, Lynx, SOE, and the RTR. The ambition around ISO 20022 is that it becomes the underlying foundation of all payments in Canada. This means not only financial institution and corporate payment message formats, but also the terminology, component and element definitions (as defined in the ISO 20022 data dictionary), business models and APIs that are used within the payments ecosystem.

Wholesale and retail payments (with the exception of credit cards, cash and some mobile forms of payment) will all be represented in ISO 20022 message formats, as all the modernized systems adopt or migrate from proprietary and outdated legacy formats to the more modern and internet-based XML syntax of ISO 20022. The batch, wire and real-time systems will provide rich remittance information that will allow for automated reconciliation. These benefits will ultimately result in lower processing costs and reduced risk.

Another important aspect of the implementation of ISO 20022 is the concept of a faster and more streamlined payment experience from end-to-end for the end users of payments. ISO 20022 will provide a foundation for innovation that will help make this user experience become a reality. This not only refers to the provision of richer data (extended remittance information), but also to the promise of new overlay services in different sections of the payments chain, from invoicing to reconciliation.

The combination of modernizing existing core clearing and settlement systems and introducing a new RTR will provide the broadest array of payment choices to Canadian financial institutions, businesses, government and individuals. Given the common underlying definitions and message formats, contingency planning and compliance monitoring will also benefit from lower costs and reduced risk.

As ISO 20022 continues to be broadly adopted within the global community, cross-border payment flows will become easier as global interoperability becomes a reality. SWIFT's current discussions around migrating their traditional MT formats to ISO 20022 will be a major catalyst for this. In addition, the U.S., Canada's largest trading partner to the south, already has plans in place to adopt ISO 20022 for their high-value payments and are assessing how to proceed along that same trajectory for low-value payments.

## ISO 20022 Adoption Strategy

Payments Canada is developing an ISO 20022 Adoption Strategy to ensure that ISO 20022 is considered holistically across systems. The Adoption Strategy will ultimately touch on all the Modernization initiatives and systems, as they include the ISO 20022 standard as part of their respective implementation plans. It will include the information necessary for financial institutions and businesses to make strategic decisions internally around the development of ISO-compliant systems that will ultimately help them to reduce operational costs and leverage opportunities for innovations and synergies across payment systems.

The ISO 20022 Adoption Strategy starts with guiding principles and an overall adoption approach that will be applied consistently across all modernized systems. Each system will ultimately create their own detailed implementation plan that will include specifics about ISO 20022 messages and adoption. The goal will be to leverage this common approach to save time and resources during the rollout of ISO 20022 across the Modernization Program.

The following guiding principles will be put in place as ISO 20022 messages and APIs are designed for use in all modernized systems at Payments Canada. These principles are consistent with the SWIFT ISO 20022 Harmonization Charter that has been adopted by financial market infrastructures (including Bank of Canada and Payments Canada) around the world. The charter includes best practices that will enable global interoperability of ISO 20022.

Dimension	Guiding Principle for ISO Message Development
Common Language, Messages and Elements	<ul style="list-style-type: none"> <li>• Payments Canada will use common messages across all systems and align with the global market practice for message usage</li> <li>• Payments will use the ISO 20022 element names and usage definitions across all payment types (batch or single credits/debits)</li> </ul>
Version and Release Management	<ul style="list-style-type: none"> <li>• Payments Canada will maintain the most recent versions of ISO 20022 messages in our message portfolio</li> <li>• The updates to the ISO 20022 messages within the Payments Canada message portfolio will follow the SWIFT annual Standards Release cycle</li> </ul>
Remittance Information	<ul style="list-style-type: none"> <li>• In the target end-state, requirements to make remittance information available will be consistent across Lynx, the RTR, and certain streams within the SOE (including AFT)</li> </ul>
Flexibility and Room for Innovation	<ul style="list-style-type: none"> <li>• These principles will not preclude the use of certain elements by bilateral agreement between financial institutions and corporates for value added services and/or to satisfy a unique requirement of a corporate</li> </ul>

**Figure 13: Guiding Principles for ISO 20022**

All the ISO 20022 messages that Payments Canada develops will be based on the same master message set and will derive their content from the ISO 20022 repository/dictionary and inherit the properties of the components and elements in the ISO 20022 data dictionary. In this way, all our messages will be aligned and harmonized and could easily be shifted from one rail to another by

---

participants. This lowers maintenance costs and risk by allowing simpler contingency arrangements and harmonized approaches to compliance monitoring, fraud detection and security.

In order to facilitate the vision of a faster and more streamlined payment experience from end-to-end, standardized specifications for corporate messages (PAIN – payment initiation, and CAMT – cash management reporting) will be provided. This will help to enable better straight-through-processing and automated reconciliation for businesses and provide increased certainty to both businesses and vendors. Other benefits include a ubiquitous experience for businesses using more than one financial institution for sending payment instructions. The standardized PAIN and CAMT messages will follow the same design principles as inter-financial institution messages. Additionally, requirements will be embedded into operating rules to ensure that financial institutions are able to, at a minimum, support these standardized PAIN messages. The standardized CAMT messages will likely remain as recommended guidelines, given the more diverse requirements of the corporate community with respect to reporting.

To ensure the successful adoption of ISO 20022, each individual system will have its own adoption/migration approach based on system-specific requirements, however the following overarching principles will be followed as each system creates their adoption/migration plan for ISO 20022:

- ISO 20022 will be mandatory for **all modernized systems**
- Where appropriate, **early adoption** will be enabled and encouraged
- **Minimize risk**
- **Minimize coexistence periods** where appropriate
- Be mindful of **impacts and dependencies** between systems in establishing timelines and sequencing
- **Publish message specifications as early as possible** to allow financial institutions and stakeholders to download documentation easily and quickly. In addition to publishing the information on the Payments Canada website, it will also be made available on SWIFT's MyStandards platform.

## 2.9 Policy and Legal Framework

Payments Canada's Modernization extends beyond modernizing systems and technologies. To keep pace with a rapidly changing environment, it is crucial that Payments Canada be supported by modern, flexible and robust policy and legal frameworks. These frameworks start with a strong statutory foundation, including the Canadian Payments Act (CP Act) and the Payments Clearing and Settlement Act (PCSA). Under the CP Act, Payments Canada is accountable to the Minister of Finance, and its core payment systems are overseen by the Bank of Canada in accordance with the PCSA. Payments Canada carries out its mandate, as set out in the CP Act, in part through establishing by-laws, rules, and standards to govern its systems.

The Government of Canada is expected to review the CP Act in 2018. As part of this review, Payments Canada will advocate for the changes needed to support the Modernization Program and the proper governance of the new systems. Payments Canada will also work to identify and secure support for legislative changes to position Payments Canada for the future including, as discussed below, the changes needed to support a broader membership base.

---

As a network industry, innovation in payments is often a product of both competition and cooperation. While the Modernization Program is in some ways a response to the evolution of technology in the sector in Canada and globally, it is focused more on driving future innovation in the Canadian payment system, which is core to Payments Canada's public policy mandate. The growth of FinTech is a global phenomenon that has major implications for the financial sector, and payments more specifically. In Canada, "Paytech" firms<sup>9</sup> have emerged as both a cooperative and competitive force relative to established players. Incumbent financial institutions and payment networks are also driving new Paytech innovations, at a sometimes surprising rate.

In this context, the Department of Finance plans to implement a new regulatory regime to oversee retail payment services - capturing non-financial institution payments service providers, the expected future participants in the RTR.

The Competition Bureau has conducted a market study to help guide financial sector regulators on ensuring that regulation does not unnecessarily impede innovation and competition in the financial sector. Payments Canada is in general agreement with the Competition Bureau's views on our clearing and settlement systems, and the legislation, by-laws, and rules that underpin them. In the response to the Competition Bureau's recent public consultation, Payments Canada has emphasized the actions it is taking to support more open, risk based access, including establishing a real-time core system for retail payments as a platform for innovation. The response also communicated that delivering a modern payment system in Canada that provides more open, risk-based access is a key goal for Payments Canada, but one that will require amendments to our enabling legislation, the CP Act, and the introduction of the federal government's Retail Payments Oversight Framework.

## **Policy, Legal and Governance Oversight**

Payments Canada is focused on developing modern, flexible systems while ensuring they remain safe and sound. As each system is modernized, they will continue to have a well-founded, clear, transparent and enforceable legal basis. System participation and enforcement will be supported by by-laws, rules and contractual arrangements as appropriate.

Payments Canada has a role to play in facilitating innovation and interoperability as it works to develop modern, flexible systems. The Modernization initiative allows for a sustained focus on developing a legal framework that fosters the development of those systems while ensuring that all are still safe and sound. Payments Canada will continue to employ strong governance practices that ensure accountability to its users and the public, including through engagement with the Stakeholder Advisory Council, Member Advisory Council and through public consultations where required.

## **The Modernization Program Policy Changes**

For Modernization to be truly supported across the Canadian payments ecosystem, it must also be supported by a modern policy and legal framework. Such a framework will foster innovation, support further technological developments and help inform the drafting of by-laws and rules.

---

<sup>9</sup> <https://www.payments.ca/industry-info/paytech-canada/paytech-resources>

---

The focus is on several key policy areas:

**1) Membership**

In order to enable more open access to some of Payments Canada's systems, as outlined in Section 2.3 (Access Model), Payments Canada will seek to broaden its membership base. This expansion will allow Payments Canada to engage different entities, which have traditionally been excluded from national payment systems, in a variety of new ways, while ensuring effective compliance with legal instruments and providing a voice to those new participants. Membership reform will require changes to the CP Act, and will be influenced by the Government of Canada's planned oversight regime for retail payment service providers.

**2) Alignment of our rules with a new retail oversight regime**

Payments Canada will work closely with the Government of Canada as it develops its payment service provider oversight framework, so that the design of Payments Canada by-laws, rules and standards take into account the new regulatory framework, minimize overlap and provide clarity for end users as to the applicable rules, standards and recourse.

**3) Support for interoperability and innovation**

Payments Canada will implement a framework of rigorous analysis and research to proactively assess opportunities to add value to members and the Canadian payments ecosystem. The framework will facilitate payment system interoperability and the development of new payment systems and technologies. The framework will also include ongoing research, scenario analysis, risk assessment and engagement with members, regulators and stakeholders.

**4) Enhanced Compliance Framework**

To continue to promote the efficiency, safety and soundness of Canada's core clearing and settlement systems, Payments Canada will be enhancing its compliance framework to align with evolving regulatory standards and its compliance powers set out in the CP Act. New systems, processes and the legal framework will enable enhanced monitoring capabilities and the ability to address compliance matters proactively and more promptly. The effectiveness of the compliance framework will continue to be subject to ongoing oversight by our regulators.

**5) Modernized Policy and Regulatory Tools**

In support of all this, Payments Canada has developed a new internal framework for creating, revising and implementing by-laws, rules and standards/statements of principle. The new framework will bring structure and consistency to the tool set, yet be flexible enough to ensure the tools remain relevant in an evolving payments ecosystem. The framework will also guide decisions to best promote Payments Canada's legislated public policy objectives.

Payments Canada is also considering whether the existing by-law, rule and standard/statement of principle approval processes are optimized for the modernized payment systems. Payments Canada will be recommending any changes to the CP Act needed for Modernization and Payments Canada's ability to properly govern the new systems.

# 3. INTEGRATED PLAN

## 3.1 Guiding Principles

The Industry Roadmap and High-Level Plan published in 2016 has evolved as Payments Canada continues to engage with payments ecosystem stakeholders, members, and regulators and has progressed with Modernization activities. Additional planning was conducted in response to new regulatory requirements, input from members, stakeholders, vendors, and from international and domestic experiences. Six general guiding principles were developed to support this effort at the program level:

1. **Ensure Safety and Reliability:** Minimize the probability of operational events occurring and proactively work with partners to mitigate impact while meeting or exceeding all regulatory requirements
2. **Deliver Quickly:** Deliver as quickly as possible, with short term quick wins where sensible, to deliver benefits to end users and other stakeholders
3. **Deliver Full Scope:** Ensure delivery of the full roadmap scope to the extent possible as set out in 2016 to meet the expectations of end users and other stakeholders
4. **Enable Innovation and Interoperability:** Create an environment which supports and promotes innovation and interoperability
5. **Build for the Long Term:** Invest in initiatives that deliver long-term benefits and efficiency for the payments ecosystem
6. **Minimize Regrettable Spend:** Manage Payments Canada, member and stakeholder resources effectively, prudently, and transparently, ensuring any regrettable spend is minimized .

## 3.2 Work Plan for 2018

The next 12 months represent a key period for the development of Lynx, SOE, RTR, AFT, Regulatory and Rules Modernization as several key decisions around planning and procurement will be made. Although we have built contingency into all our plans, the work plan for 2018 is where we have the greatest confidence in our timelines.

The figure below provides a high-level overview of major milestones of the Modernization Program in the near term with additional detail provided on each of the systems in the sections below.

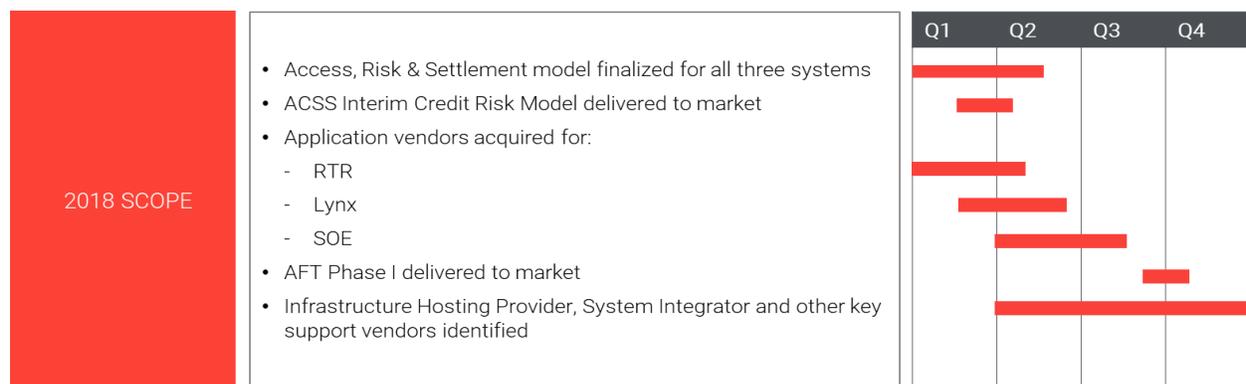


Figure 14: Modernization 2018 Major Milestones

---

## ACSS

- **Implement an Interim Credit Risk Model**

ACSS is a deferred net settlement system that is currently uncollateralized and does not meet PPS requirements. To address this gap, the Interim Credit Risk Model will be implemented and will stay in place until Phase II of SOE.

- **Develop Legal Framework**

The Interim Credit Risk Model will be supported by a strong legal framework. Introducing collateral requirements for the ACSS require amendments to By-law No. 3 and related rules.

## Lynx

- **Select Application Vendor**

Payments Canada initiated competitive dialogue, and chose three vendors to acquire a solution and defined high-level requirements in parallel. Phase I of the dialogue involved learning from the vendors and detailing requirements, Phase II involved a proof-of-concept to demonstrate capabilities and Phase III involved receiving final proposals from suppliers on their proposed solution. The Lynx application vendor will be selected by the end of January, with the contract expected to be signed by the end of the 2<sup>nd</sup> quarter.

- **Select System Integration and Infrastructure Hosting Partners**

After the application, the next critical step is to engage the right system integration and infrastructure hosting providers (exploring both traditional and cloud hosting options).

As a key tenet of the process, Payments Canada will focus on minimizing the overall number of vendors to ensure accountability and reduce delivery risk. Vendors will be evaluated using a number of factors including payments ecosystem experience, track record of delivery and operational excellence, technology and industry expertise, and resource capabilities. The first priority will be to engage a system integrator to assist with design and development of systems and data integrations, and to ensure all components are sufficiently tested and validated before implementing to production. The hosting provider will establish and maintain secure and resilient infrastructure to operate the modernized Lynx platform.

- **Commence Close Examination and Configuration of LSMs**

Once a vendor is selected for Lynx, Payments Canada will work with participants to consider how best to configure the available LSMs, and start simulating different configurations of LSMs.

## RTR

- **Procure Service Provider**

Payments Canada is assessing a single source service provider, with existing connectivity and broad presence in the market, to help drive strong initial adoption of the RTR and facilitate the path to ubiquity. Functional, non-functional, reporting, and technical architecture requirements were drafted and forwarded to the potential service provider. The current integrated work plan assumes an existing market player will be selected as the RTR service provider; however, alternative approaches have been assessed should this assumption require updating.

- **Determine the Phased Approach**

Payments Canada will finalize the RTR scope by converting the high-level requirements into detailed requirements. While release details have yet to be finalized, the objective of Release 1 (R1) is to deliver robust functionality to support the final access and risk models (e.g., settlement functionality) along with the proposed end-to-end payment processing timeframes. As part of R1, the RTR will employ ISO 20022 as its core messaging protocol. Participants will be required to receive ISO 20022 messages to participate in the RTR.

The figure below outlines the draft scope of R1:

	Release 1 (Q2 2019)	Release 2+ (2020 and beyond)
<b>In Scope Functionality</b> <i>(Payments Canada)</i>	<ul style="list-style-type: none"> <li>• Credit transfers utilizing ISO 20022 messaging</li> <li>• Alias management utilizing a National AliasDB (ProxyDB)</li> <li>• Risk &amp; Settlement capability (DNS / PRS, HABS, etc.)</li> <li>• Reporting (application native with ability to price and manage fraud)</li> <li>• Initial fraud management capabilities</li> <li>• Participant administration</li> </ul>	<ul style="list-style-type: none"> <li>• Request to Pay (RTP) functionality (Release 2)</li> <li>• End-to-End support for ISO 20022 (adoption of PAIN and CAMT messages by participants, improvements to handle increased payload requirements)</li> <li>• Cross-border/ international payments enablement</li> <li>• Support for AFT and EDI processing (e.g., batch payments processing capabilities)</li> <li>• Business intelligence and advanced analytics</li> <li>• Enhanced fraud management capabilities</li> <li>• Additional market-requested functionality (to be determined)</li> </ul>
<b>Key Delivery Components</b>	<ul style="list-style-type: none"> <li>• Core transaction processing rail</li> <li>• Alias management/National AliasDB (ProxyDB)</li> <li>• Settlement engine</li> <li>• Reporting engine</li> <li>• Interfaces</li> </ul>	<ul style="list-style-type: none"> <li>• New capabilities on existing RTR components (Cross-border/Int. clearing and settlement, RTP, batch payments)</li> <li>• Data warehouse/lake with full scope analytics engine (structured and big data)</li> <li>• Pricing engine</li> <li>• Fraud management</li> </ul>
<b>Rationale</b>	<ul style="list-style-type: none"> <li>• Open access with ISO20022-based API</li> <li>• Independent AliasDB</li> <li>• Overlay service support</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction of additional functionality (Cross-border/Int.)</li> <li>• Advanced analytics across the ecosystem as a service</li> <li>• Adoption of additional overlays</li> </ul>

**Figure 15: Release 1 Scope and Key Delivery Components**

Decisions on releases will be guided by factors such as speed to market, ability to handle current volumes, and ease of connectivity. In addition, work to stimulate creation of overlay services by market participants will also be initiated. The scope, timelines and sequence of future releases will be established and will deliver functionality such as additional messaging and other items not included in the initial release.

- **Define Key Design Principles**

The access and risk models are important inputs to the design of the overall RTR solution and impact the planning activities of member financial institutions. Therefore, work on defining and finalizing the access and risk models will be completed with input from members and stakeholders.

- **Initiate Design Phase**

Once the access and risk models, along with key technology principles, have been defined, Payments Canada will work collaboratively with the selected service provider to translate detailed requirements into functional designs. The solution will be developed iteratively to allow for a timely incorporation of end user feedback.

## Settlement Optimization Engine (SOE)

- **Validate Interest in Direct Access to SOE**

The proposed centralized exchange model for SOE is intended to increase efficiency and address potential operational barriers to entry of the current bilateral exchange model. However, it has significant impact to existing Direct Clearers. Therefore, Payments Canada is validating the interest of Indirect Clearers to directly access the SOE either as Direct Clearers or to directly exchange payment files. Sufficient interest to directly accessing the SOE will be needed for the development of the proposed centralized exchange model.

---

- **Determine SOE Delivery Strategy**

Payments Canada has decided to decouple SOE delivery from Lynx. Given this decoupling, Payments Canada will need to conduct additional scoping and planning for the SOE and make critical decisions around the acquisition strategy. Currently, Payments Canada plans to implement Lynx before SOE because Lynx is the core clearing and settlement component. However, this is dependent on the scope of each transition phase of the SOE and the procurement decisions.

- **Define SOE Financial Risk Model**

Payments Canada will consider the implication to the ACSS Interim Credit Risk Model of meeting the PPS Standards, in particular same-day settlement, risk management and access, and will propose the necessary amendments to the ACSS Interim Credit Risk Model.

- **Determine Same-Day Settlement Times**

SOE will be expected to meet the same-day settlement requirements to satisfy the Bank PPS Standards. Payments Canada will perform analysis to determine the settlement times and the payment streams which qualify for same-day settlement while keeping the impact on the business processes at the financial institutions top of mind.

## AFT Phase I

- **Participate in Inter-Financial Institution Testing**

Given the scope of changes included in AFT Phase I, there is a need for all financial institutions to participate in an inter-financial institution test phase to ensure any issues are flagged in a timely manner and are resolved prior to the implementation of the new functionality. To that end, Payments Canada will work closely with the financial institutions to define a robust inter-financial institution test strategy and plan. Payments Canada will then lead an inter-financial institution test phase where Direct Clearers will test AFT file exchanges. This effort will also inform and enrich the creation of a Testing and Simulation Centre of Excellence, which will benefit the delivery of the other systems.

- **Implement Phase I**

The Phase I functionality will be rolled out incrementally to reduce the risk that the ongoing operation of AFT is impacted. Early in 2018 Payment Canada will implement the required changes to the FIF application; however, the new Serviceability Code, a code representing the number of Business Days required to credit a Payee's account with an AFT Credit Transaction, code 0, will not be activated and member FIF output will remain unchanged until the Phase I go-live. Following the successful completion of inter-financial institution testing, all Direct Clearers will implement the third Exchange. This will be followed by a brief stabilization period and then Direct Clearers will have until October 15, 2018 to comply with the new funds availability requirements.

- **Rules in Effect**

The above-mentioned enhancements require amendments to existing Rules F1, F4, F7, K8 and G12 which govern the exchange and, clearing and settlement of AFT transactions. These draft rules were approved by the Board of Directors in June 2017.

---

## Preparing for AFT Phase II

- **Amend Existing Rules**

Though the primary focus of the next 12 months will be AFT Phase I, Payments Canada also expects to start preliminary work on AFT Phase II. The main priority will be to assess the impact of Phase II functionality on the Rules and initiate work on drafting and consulting on the necessary changes.

- **Develop Migration Approach**

The migration approach for Phase II of the AFT remains subject to discussion between Payments Canada and members. An end date for mandatory use of ISO 20022 for AFT will be set. Work will commence on stimulating the market for ISO 20022 early adoption and an end date for the mandatory use of ISO 20022 will be set for Direct Clearers and participating Indirect Clearers.

- **Increase ISO 20022 Awareness**

The goal over the next year is to significantly increase ISO 20022 awareness within the business and vendor communities. Businesses of all sizes stand to benefit from the use of payment products based on ISO 20022. Understanding the benefits early will allow them to start making their business case and to align with other organizational initiatives. Early awareness within the vendor community will allow vendors sufficient time to make the necessary enhancements to their products and evaluate the opportunities for innovation.

## Additional Priorities for the Modernization Program

- **Financial Institution Engagement**

In addition to the Payments Canada specific work, the Modernization Program has significant implications on the member financial institutions. Of the changes proposed, ISO 20022 is expected to have great impact on financial institutions as many are in the midst of infrastructure renewal and cannot adopt ISO 20022 until they have completed the development of their new payment hubs. In addition, Lynx is moving towards defaulter pay cover-all system, SOE has new credit, liquidity and collateral requirements; and the RTR will be a new system with its own risk, access and settlement models. All these changes will result in significant technology and process changes for the financial institutions which will require them to mobilize significant resources. As most elements of the program are mandatory for member financial institutions, unlike for other stakeholder groups, they will require appropriate lead times. As such, in the near-term, there is a need to prioritize engagement with member financial institutions and generate the delivery momentum needed to ensure that the program's overall objectives and timelines are met.

Payments Canada will share important artifacts pertaining to key decisions, system requirements, detailed designs, test strategies, approaches and plans with the financial institutions.

## Scope of Delivery Phases

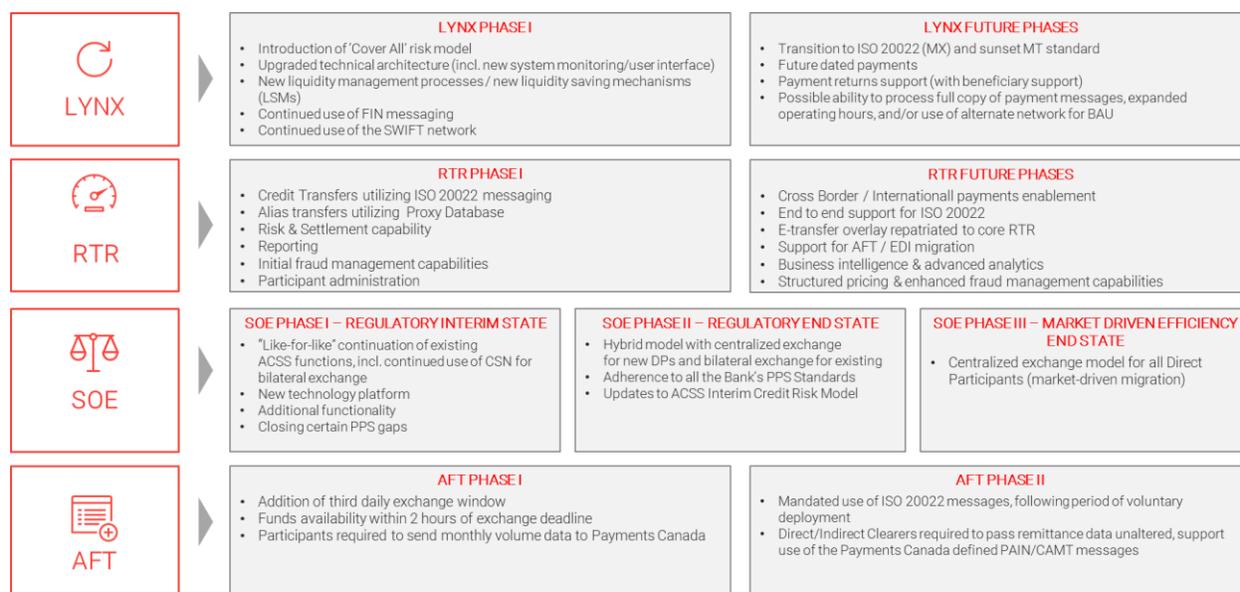


Figure 16: Scope of each delivery phase

### 3.3 The Delivery Roadmap (2017)

Payments Modernization is a complex multi-year program with far reaching impacts on the entire Canadian financial services industry. Payments Canada has set out the desired target state with an ambitious roadmap, which identifies the necessary scope and milestones to address the gaps that have been jointly prioritized between Payments Canada, the regulators, members and other stakeholders. The Delivery Roadmap depicted in Figure 18 is based on the guiding principles described in Section 3.1, inputs from members and stakeholders and lessons learned from similar implementations across the world. Payments Canada understands that the overall Delivery Roadmap is at the aggressive end of our collective capabilities to execute. As such, it is expected and acknowledged that as new decisions are made, requirements are refined and scope finalized, there will be a need to revisit and update the plan at regular intervals. Many of the key decisions that are yet to be made can have a significant impact on the program timelines and as such the Delivery Roadmap has included date ranges for the delivery of the systems beyond 2018 where less certainty is known. Payments Canada will publish an annual update on the Delivery Roadmap and also validate the strategy against the situation in the market every six months.

## Confidence Levels

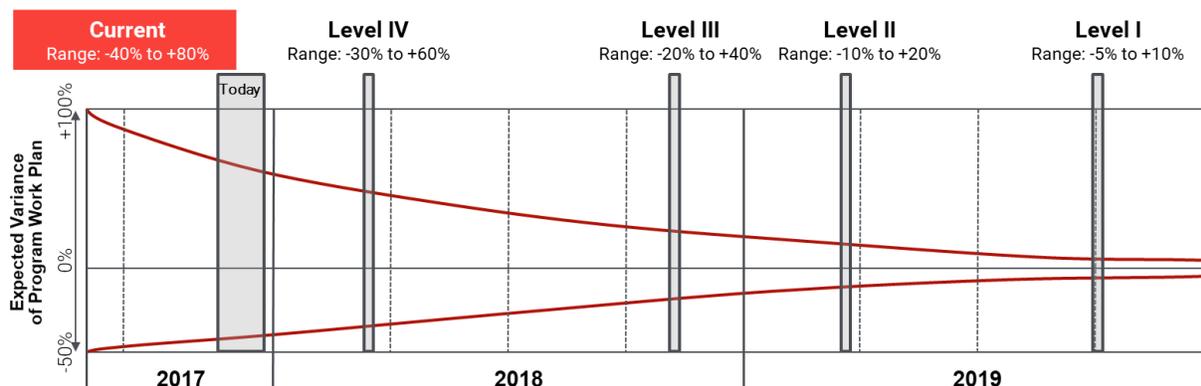


Figure 17: Delivery Confidence Ranges

The confidence levels in the timelines set out in the Delivery Roadmap are currently in the range of -40% to +80% as presented above. The confidence levels presented above refer to the expected variance of the program work plan and are not representative or proportional to budget confidence levels. The accuracy of these timeline estimates vary based on the level of project definition and maturity. Some aspects of the program being delivered in 2018 have much more certainty in planning timelines such as ACSS Credit Risk Model and AFT Phase I and are estimated to be in the -10% to +20% confidence level. The Lynx, SOE and real-time payment systems are however still at the vendor procurement stage, and as such have a higher variance range. Confidence levels in the timelines are expected to increase as vendors are chosen in 2018.

### Key Highlights of the Delivery Roadmap

- Lynx and the RTR are the critical platforms and as such are highest priority for delivery.
- Phase I of Lynx will be delivered in 2020. Subsequent phases, which include the use of ISO 20022 and payments tracking, will be delivered in future phases beyond 2021.
- RTR will be delivered iteratively with an initial release scheduled in 2019 followed by subsequent releases in 2020+. In addition, the market will be stimulated for RTR overlay services and ISO 20022 adoption. These dates are contingent on satisfactory delivery of the Design Phase as a joint project between the single vendor and Payments Canada.
- SOE will be delivered in three phases. Phase I, which will be an “ACSS like” replacement is scheduled for early 2021 while Phases II and III will be implemented in 2021 or beyond.

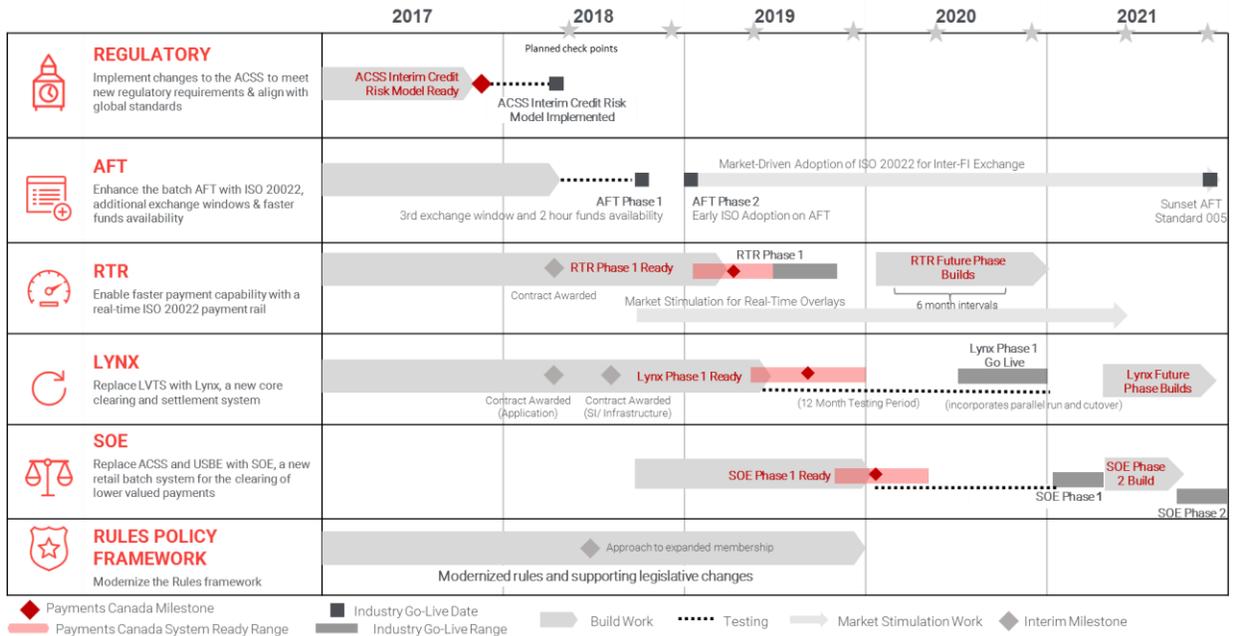


Figure 18: The Delivery Roadmap

## Business Stages of Delivery

The Delivery Roadmap shows an iterative approach which builds value over-time and works towards the targeted end state. This phased approach allows prioritization of high-value areas while keeping in accordance with the Guiding Principles for the program, ensuring safety and reliability, delivering value quickly and managing resources. There are three key stages which will drive us towards our target end state:

- 1) Flexibility for funds movements (Western Canada)
- 2) Faster, data- rich payment capability
- 3) Modern infrastructure for settling large value payments

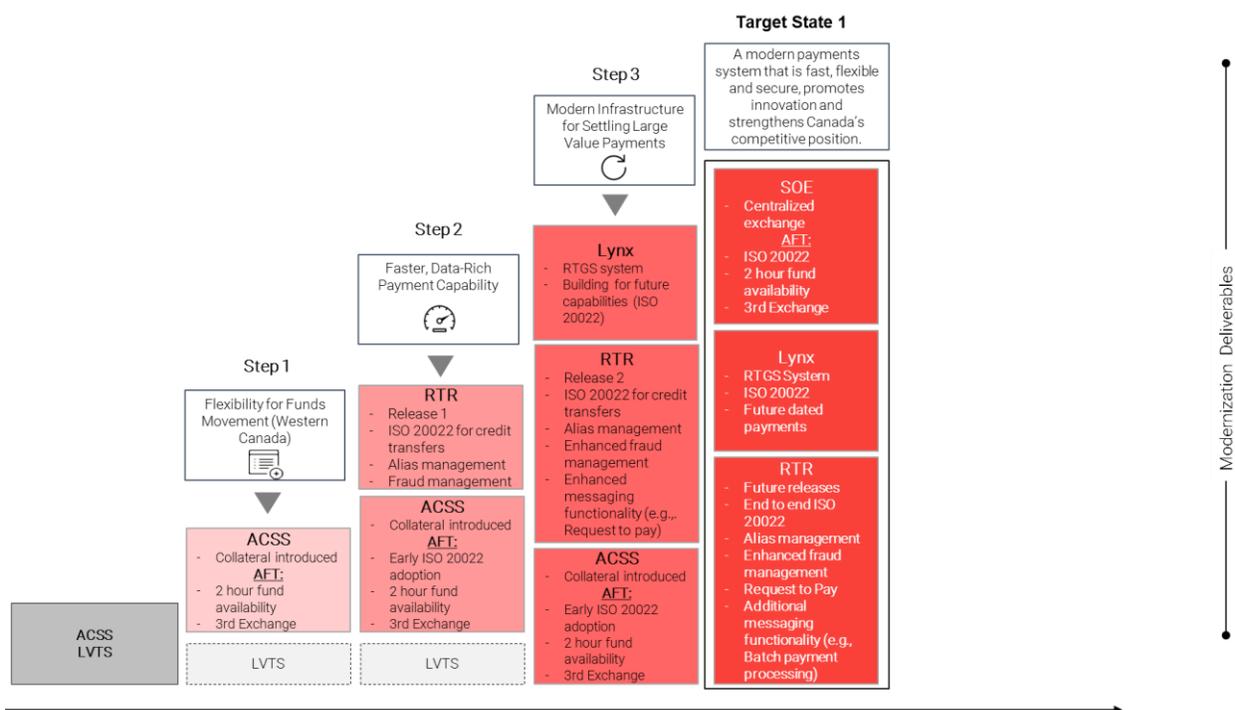


Figure 19: Stepped approach to delivering value

## 3.4 Risk Management

### Context

The target state for the Payments ecosystem will generate new risks associated with changing the core payment systems infrastructure, changing risk and settlement models for the high-value system and widening access and participation opportunities with new rules. The greatest risk arises from the fact that this is an industry wide project, requiring alignment among a great many players. A strong risk management strategy is needed to ensure successful delivery and ongoing management of the program.

Transformation requires a robust framework for understanding all risks, their likelihood, impact and timelines, and making decisions based on a defined risk appetite. An integrated and holistic approach to risk management enables Payments Canada to understand the interdependencies between risks while ensuring consistency in managing risk across the entire program. Risk management is an ongoing process as internal and external expectations continuously evolve, necessitating flexibility and change management throughout the project delivery.

## Risks Across the Ecosystem

Using our Enterprise Risk Management (ERM) Framework as a reference point, risks across the payments ecosystem can be grouped into four key risk categories; strategic, operational, financial and settlement risks.

	Strategic Risks	Operational Risks	Financial Risks	Settlement Risks
<b>Description</b>	Risk that affects, or is created by, Payments Canada’s business strategy and strategic objectives	Risk resulting from inadequate or failed internal processes, systems and IT, people or policies, or from external events	Risk related to Payments Canada’s funding and financial reporting	Risk that settlement in Payments Canada operated payment systems will not take place as expected and may result in credit and/or liquidity risk contagion for Payments Canada members
<b>Example</b>	One or more participants do not stay on schedule, causing significant program delay and cost to the industry.  Low participation (i.e. “buy-in”) from the industry results in a scenario in which the real-time payments system fails to achieve broad-based adoption and ubiquity.	Cyber-attack causes major service disruption impacting the ecosystem	Major overrun on costs related to development and implementation of Lynx or major delay in delivery of systems	Major Lynx outage causing settlement to not occur same day
<b>Mitigation</b>	Clearly defined integrated roadmap accepted by FIs and strategy for responding to any FI that does not stay on schedule	Integrated cyber, business continuity and crisis management response	Clear risk appetite statements to guide budget and schedule management	Risk controls; Credit, liquidity and tiered participation monitoring and reporting

Figure 20: Risks Across the Ecosystem

These risks are borne by the various participants in the ecosystem. Responsibilities for managing these risks are defined in partnership with the industry and will be shared at a later date in a document entitled *Responsibility for Management of the Risk Related to or Arising from Payments Canada Operated Payment Systems*.

From another perspective, risks must be managed across the following structures:

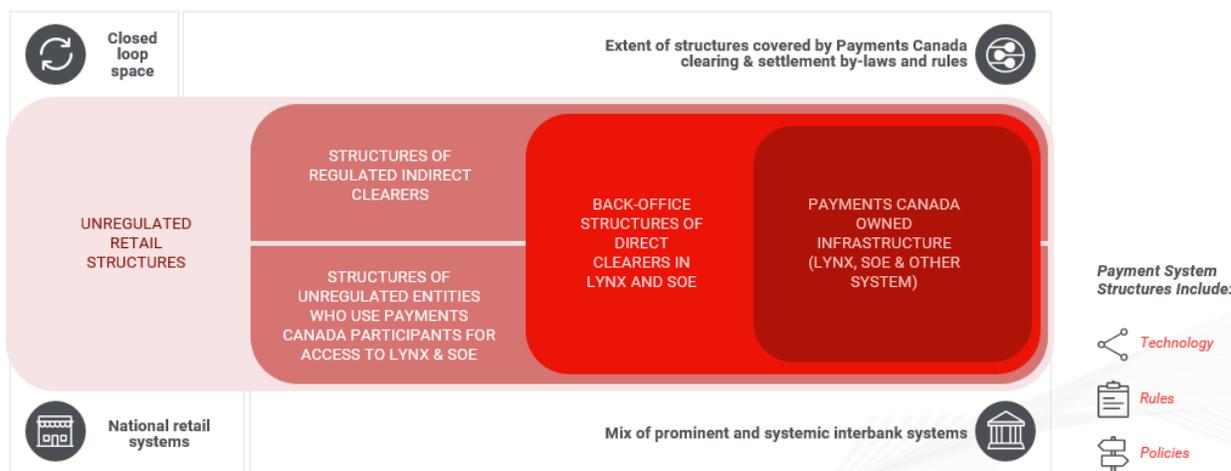


Figure 21: Risk Structures Covered by Payments Canada Clearing and Settlement By-laws and Rules

## Delivery Risk Management

Payments Canada’s risk appetite will be used strategically throughout the management of the Modernization Program to facilitate ongoing discussion of important issues and informed delivery decisions. Integrated risk reporting will provide a consistent and complete view of all key components. Risk will be managed in alignment with Payments Canada’s risk appetite and will be limited to what is appropriate for the Modernization Program. Rigorous risk management strategies and processes will be used to build resilience through integrating incident management and specifically cyber security response into Payments Canada’s business continuity and crisis management structure. Delivery/implementation-related risks arising during transition to the target state will be carefully identified and addressed, to ensure sound, risk-based decision making.

A few examples of risks associated with delivery/implementation include:

- Risks associated with employing a simultaneous launch versus a phased implementation strategy
- Risk of one or more participants in a system not being ready for implementation date (falling behind schedule)
- Risk of one or more direct clearers not being successful on implementation day (having to back out)
- Offering new services such as data strategy without introducing appropriate controls
- Cyber attacks

## Next Steps for Risk Management

Payments Canada is initiating an Industry Risk Working Group to help Payments Canada manage the risk of the Modernization Program. The group will discuss how payment system participants will manage ecosystem risk in the target state, including delivery risk, operational risk, financial risk and technology risk. This group will advise on whether Payments Canada has identified all appropriate risks and developed appropriate mitigation plans for the identified risks

---

## 4. BEYOND MODERNIZATION

### 4.1 Potential Future State of Payment Systems (2021+)

#### The Future of Payments in Canada

Canada has been at the forefront of several pivotal technological changes over the past decade. Modernization is poised to further accelerate these changes, ensuring that Canada remains a payments leader in the decades ahead.

Modernization lays the foundation to enable the next wave of payments evolution through a combination of elements: a new RTR, major enhancements to the current high-value and batch systems, harmonization of payments data into a rich 'digital ready' standard, and important changes to rules and by-laws. All of these elements will be delivered with a continuous eye toward safeguarding the safety and soundness of the payments ecosystem.

Beyond the delivery of the Modernization roadmap in 2021, Payments Canada envisions several key outcomes that will continue to shape the future of the Canadian payments landscape.

#### Three 'Fit for Purpose' Payment Systems

Canada will have modern payments infrastructure, structured around three core systems (high-value, batch retail, and real-time retail) addressing the full range of payments use cases with the appropriate speed, cost, data richness, and risk model. Moreover, Payments Canada will strive to reduce friction from payments and offer digital alternatives to decrease the usage of paper-based payments.

All three core systems will be 'fit-for-purpose', operate in a complementary manner, and employ a harmonized data messaging standard (ISO 20022).

#### Data-Rich, ISO 20022-Enabled Economy

Payments Canada's core systems will enable an interoperable, data-rich payments ecosystem, centered on the ISO 20022 messaging standard – enabling a "rail-agnostic" payments experience. Over time, as businesses and governments adopt the standard, this will allow for a more seamless integration across the payments ecosystem and within the broader digital economy. Payments Canada expects that legacy and proprietary standards (such as EDI) will gradually be retired, with the occasional 'nudge' as appropriate, to ensure progress is being made for all Canadians. Globally, Canadians will benefit from simpler cross-border transactions as other countries also adopt ISO 20022. Payments Canada maintains strong, collaborative relationships with other jurisdictions and central standard bodies, and will look to ensure that Canada's ISO 20022 implementation is consistent with other regions.

---

## Accelerating the 'End of Paper'

Beyond 2021, Payments Canada foresees an accelerated decline in paper-based payment methods as well as cash. Canadians are already increasingly replacing cash and cheques with digital payment methods. This trend is expected to accelerate as Modernization will enable broader range of use cases for digital payments. For example, real-time payments will address cash and cheque use cases where there is need for an immediate transfer of funds with irrevocability (e.g., rent payments). Similarly, ISO 20022 will allow the data to 'flow with the payment', reducing the need for paper statements and invoicing. Built on a modern, 'digital-friendly' architecture, Payments Canada's systems will help reduce payments friction, further eroding the need for paper-based items.

## Increased Access and Competition

Payments will remain a popular arena for innovation, with financial institutions, technology companies, and other smaller players continuing to bring products and services to the market. Beyond 2021, Payments Canada envisions a more accessible and competitive payments ecosystem with open, risk-based access requirements and more flexible options for direct participation by financial institutions and PSPs. Payments Canada expects that expanded access to Canada's core payment systems, in particular the batch and real-time payments, will ensure competition and catalyze the next wave of innovative and new offerings.

In particular, expanded access will allow smaller players to compete by eliminating the need to support all payment streams or clearing and settlement. Payments Canada expects that larger, incumbent players may likewise find opportunities to develop new clearing and settlement agent models to support this 'unbundling' of payments streams and processes. More importantly, this expanded access and corresponded benefits will not come at the expense of safety and soundness.

## Potential Payment Migration Scenarios

The following section overviews potential migration scenarios of payments streams across Payments Canada's three core systems, following the completion of the Modernization Program in 2021.

The long-term payment flow forecasting is highly complex, as such Payments Canada expects that the following scenarios will evolve as the program progresses and as changes in payments behavior can be observed. Consequently, the following scenarios are predominantly qualitative in nature and intended to indicate directional trends.

Payments Canada further recognizes that the introduction of the RTR, Canada's first new core system in 20 years, will result in the migration of some existing payments streams. This migration could result in the long-term consolidation of retail payment functionalities into a single system; however, the pace and magnitude of this migration remains unknown.

Payments Canada will actively monitor volume migration to ensure that all three of Canada's payment systems remain fit-for-purpose.

---

## Migration Scenario #1: High-Value Payment system to Real-Time and Batch Payment Systems

Payments on today's high-value payment system (LVTS) include a significant number of low-value items. In 2016, approximately 61% of payments on LVTS were for less than \$50,000 (with 42% at less than \$10,000). A key driver for these low-value LVTS payments is the need for immediate transfer of funds, with confidence of settlement finality – particularly amongst commercial and small business payors.

The new RTR is expected to address a large portion of the low-value use cases in a comparably more cost-efficient manner. As such, Payments Canada expects a migration of low-value payments from LVTS/Lynx to the RTR. Similarly, the batch payment system will move to same-day settlement, which is expected to result in the migration of some low-/mid-value LVTS/Lynx payments to SOE in cases where slower intra-day settlement is sufficient.

In both cases, payment item value caps will be put in place to prevent undesired and/or unintended migration of high-value payments to either the RTR or the SOE. Lynx will remain the system for all high-value payments, with the appropriate risk model to ensure the safety and soundness of Canada's financial system.

## Migration Scenario #2: Batch Payment system to RTR

The new RTR will enable Canadians to make immediate, data-rich payments with confidence of settlement finality. Real-time payments are expected to address a broad range of consumer, business, and government use cases where speed is important and payment value is relatively low (e.g., vis-a-vis Lynx). The new RTR will likewise support a suite of capabilities, designed for the digital economy including:

- **Rich Remittance Information:** the RTR will use ISO 20022 as its native messaging standard, and therein providing richer data with payments and facilitating domestic and international interoperability
- **Overlay Services and APIs:** Additional payments products and services can be developed and offered by financial institutions or other third-parties, leveraging the RTR
- **Open Risk Based Access:** With the proposed 'cover-all' risk model, the RTR is expected to accommodate higher transaction limits than current in-market offerings. Doing so will allow the system to serve a broad set of consumer, business, and government use cases. Risk-based access requirements will be implemented to ensure the safety and soundness of the system while providing fair access to all who meet the requirements.
- **Payment Aliases:** The RTR will simplify the payment initiation experience by allowing users to make payments using a mobile number, email, or other identifiers without the need to know the beneficiary's bank account number.

While real-time payments offer a clear value proposition, predicting the pace and magnitude of migration for other payment systems (notably batch) is uniquely challenging in Canada. While many jurisdictions have implemented real-time payments schemes, with varying rates of adoption, Canadian consumers are largely accustomed to near real-time payments experiences through Interac e-Transfers. Likewise, commercial payments in Canada are traditionally resistant to change, with migration occurring slowly due to the need to upgrade corporate payment systems as well as change behavior.

---

Given these complex dynamics, below are directional predictions for the migration of select SOE payments streams:

**Cheques:** the decline in cheque use will accelerate, as the RTR will address capability gaps with existing in-market options. This prediction is consistent with the U.K. experience, which saw a significant decline in cheque usage post-modernization; increasing from a 4.0% annual decline pre-modernization, to double digits in recent years. Inclusion of features such as request-to-pay will serve to accelerate this trend.

**AFT and EDI:** the RTR is expected to draw volumes away from both AFT and EDI. Corporate payors have expressed seeing value in having a real-time payments capability for select use cases (e.g., emergency payments). Several factors, however, may slow the pace of migration of batch payments to the real-time system: potentially lower cost/collateralization requirements, perceived value in revocability of batch payments, lack of business case for change for predictable/scheduled payments, amongst other considerations. Moreover, the RTR is expected to have lower transaction limits and utilize a credit-push mechanism only (whereas AFT is debit-pull). Research from other jurisdictions estimate the number of batch payments that are 'likely candidates' for migration to a real-time payment system between 10-15%; an estimate that appears plausible for the Canadian market absent future observations.

## 4.2 Future Work

This section provides a brief overview of planned, near-term work required to better predict and influence payment stream volume migration and a list of potential areas for further exploration beyond the first wave of Modernization (2021+).

### Near-Term Initiatives

In the near-term, Payments Canada will conduct further research to understand the factors influencing recent and future changes in the volume and values of payment streams (including experience from other markets), and develop a framework to evaluate options and parameters (e.g., risk controls, pricing, value caps, velocity measures) for meeting Bank of Canada expectations. In line with modernized systems, payments users should be well served by modern, ubiquitous payment options. Payments Canada will seek to assess the current role of more traditional payment streams, such as cheques and EDI, and consider (consistent with its mandate to facilitate payments innovation) options for more actively facilitating Canada's adoption of modern payment methods and supporting the longer-term phase out of legacy methods.

### Initiatives Beyond 2021

Beyond 2021, more work will be required to fully realize the benefits of Modernization and to fulfill Payments Canada's mandate to meet the needs of the payments ecosystem and ensure its safety, soundness, and efficiency.

---

Payments Canada anticipates initiatives in the following areas:

- **Drive Greater Interoperability**
  - **Domestic:** Continue leading the effort to introduce ISO 20022 across all ecosystem participants and drive ubiquity for data richness in payments throughout the Canadian market. This is key to developing a payments ecosystem that is truly interoperable and “rail-agnostic”.
  - **Global:** Continued efforts to synchronize messaging standards with other regions, in particular, major trading partners to drive international interoperability, facilitate trade across borders, and fully realize the benefits of ISO 20022.
- **Develop New Capabilities:** Investigate the potential for offering or supporting new capabilities and services (e.g., new overlay services, debit-pull real-time payments)
- **Retire Legacy Features and Payment Methods:** As new capabilities and features (e.g., ISO 20022) are introduced, there will be a need to investigate retiring paper-based payment methods such as cheques and less efficient legacy standards such as EDI for inter-FI exchange.
- **Push for Cross-Border Convenience:** Investigate ways to facilitate practical and convenient payments across borders
- **Transaction Transparency:** Revisit the need for notifications to payors and payees on the status of payments across all payment streams

## 5. BENEFITS OF MODERNIZATION

The digitization of the global economy is rapidly changing Canadians’ expectations for how they make and receive payments. Canadians increasingly want faster and ‘always on’ payments experiences that are seamless with the other elements of their digital lives. They want the convenience of initiating payments with identifiers like email and phone numbers. They want richer data that flows with the actual payment itself (rather than following by email, or worse, paper). They want all of this and more, while maintaining the utmost levels of security and privacy.

To meet these needs, Payments Canada is developing a modern payments infrastructure, designed for tomorrow’s digital world. This infrastructure will help secure and strengthen Canada’s competitive position as a global leader in financial services, and provide new opportunities to simplify and enhance Canadians’ daily interactions with commerce. Delivering a modern payment system impacts all Canadians - consumers, businesses, government, etc. – and, as such, Payments Canada has taken a broad lens when considering the benefits of the Modernization Program.

Payments Canada sees **five core benefits** that will be delivered to Canadians:

## 5.1 Five Core Benefits of Modernization

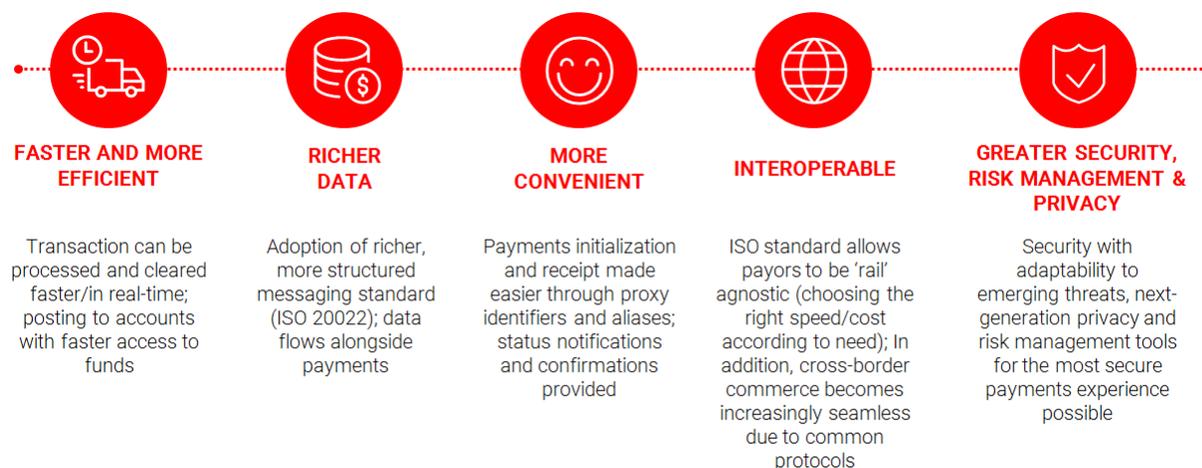


Figure 22: Five Core Benefits of Modernization

### Faster and More Efficient

Canadian businesses and consumers alike have expressed a need to make fast, low-cost payments. As the pace of commerce accelerates, driven by an increasingly “always on” and “on demand” world, businesses are seeking the ability send and receive payments faster to satisfy customer demand and streamline business processes. As other jurisdictions (e.g., U.S., U.K., amongst many others) deploy real-time payment systems, Canadian businesses want to ensure they have a level playing-field to compete, and can provide the best possible experiences to their customers.

Canadian consumers have already embraced real-time person-to-person (P2P) payments through Interac e-Transfers for lower value payments. Fintechs and other new entrants have likewise approached P2P payments as an area for disruption, with a plethora of P2P solutions emerging around the world (e.g., Venmo, Zelle, PayTM, Square Cash). With Canadian consumers already accustomed to real-time, there is a desire to expand that capability to address other applications such as bill payments, reimbursements, amongst other use cases, as well as increase the transaction limits on existing P2P payments. Addressing these needs requires a robust real-time payments platform with the appropriate capabilities and risk model to deliver commercial use cases. It must also allow for materially higher transaction limits, and enable new ways to initiate the payments themselves (via overlay services).

The implementation of a new RTR, additional AFT exchange windows with 2-hour funds availability, and deployment of the new Real-Time Gross Settlement system via Lynx will allow Canadians to conduct payments faster and more efficiently.

---

## **Key Benefits of a Faster and More Efficient Payment System**

### **Increased Speed and Predictability**

- Less time waiting for payments to clear or to receive payments (e.g., being paid for a service)
- Improved cash flow management and more predictable budgeting
- Allows for last-minute payments and avoidance of penalties for late payments (e.g., credit card or utility bills)
- Allows for irrevocable payments for real-time payments, providing certainty of receipt

### **Lower Risk**

- Funds spend less time in the system therein reducing liquidity risk
- More frequent, smaller AFT volumes/values with each window, which in turn could potentially reduce risk that financial institutions bear when providing provisional credit before the receipt of funds
- Faster good funds verification reduces rate of unintended overdrafts
- Maintains revocability of payments on AFT, which will continue to be the preferred format for some B2B and B2C transactions (e.g., payroll)

### **Increased Flexibility and Choice**

- Provides faster alternatives to less efficient payment mechanisms (e.g., cheques, cash)
- Provides alternatives to “more expensive” fast payment options (e.g., credit cards)

### **Opportunities for Enhanced Products/Services**

- Provides opportunities to enhance existing products and offer new services to better meet the needs and expectations of end users. Combining speed with additional functionality could enable new use cases (as identified below)

### **Selection of Faster Payments Use Cases**

Payments Canada has identified a portfolio of use cases that illustrate how the Canadian economy could benefit from faster payments. Below is sample set of those use cases.

<b>Stakeholder</b>	<b>Use Case</b>	<b>Scenario</b>
<b>CONSUMERS</b>	<b>Urgent Money Transfer</b>	A parent forgets to make a payment for a class trip, but can quickly send funds to confirm her son's spot before the deadline
	<b>Avoid Late Fees</b>	A customer makes a real-time payment to her internet service provider on time, avoiding late fees
	<b>Predictability</b>	A family managing their budget knows exactly when their pay will arrive and that they will be able to pay upcoming bills on time
	<b>Fast and Irrevocable</b>	A person makes a real-time payment to purchase a second-hand car (directly from the owner) and drives it home immediately upon confirmation that the funds have transferred successfully and irrevocably

Stakeholder	Use Case	Scenario
<b>LARGE CORPORATES</b>	<b>Expedited Business Payments</b>	A business seeking to expedite an important payment before end of business day can close a transaction on time to ensure prompt delivery
	<b>Payroll</b>	A large corporation can distribute payroll, bonuses, and expense reimbursements to its employees faster and later in the day, giving it more flexibility around how it manages payment cycles
	<b>Retail Rebates and Refunds</b>	A retailer can offer better, faster customer service for rebates and refunds at the point of sale
	<b>Real-Time Payment Upon Confirmation of Delivery</b>	A retailer makes a real-time payment to their supplier upon successful delivery of fragile or perishable goods, avoiding the need to make a prepayment and deal with refunds in the case of broken or perished goods
<b>SMALL AND MEDIUM BUSINESSES</b>	<b>Control Over Payments</b>	Quicker fund availability enables a small business to compress their ordering and payment cycles, improving productivity and cash management e.g., small business could get paid immediately for goods sold on their website
	<b>Save Cost on Real-Time Payments</b>	A small business makes a relatively small, urgent payment to a supplier without having to worry about high wire transfer fees or transaction limits
	<b>Improved Cash Management</b>	A small business owner can better manage their cash flow due to increased payment processing speed and predictability
<b>GOVERNMENTS, EDUCATION INSTITUTIONS AND NGOs</b>	<b>Emergency Government Payments</b>	A government agency or NGO can instantly distribute funds to victims of natural disasters and offer immediate support in distress situations
	<b>Disbursement of Entitlement Payments</b>	A university can immediately distribute student aid to students in need upon approving their application, helping them meet the payment deadline
<b>REGULATORS</b>	<b>Increased Liquidity</b>	Faster payments and less time with funds in between clearing and settlement, thus reducing overall risk from a regulatory perspective
<b>VENDORS, FINTECHS AND INNOVATORS</b>	<b>Better Customer Experience</b>	Vendors can provide their customers with faster payment solutions by leveraging the underlying real-time infrastructure
	<b>Potential for Innovation</b>	Fintechs and innovators can develop creative new real-time payments products and services
<b>FINANCIAL INSTITUTIONS AND PSPs</b>	<b>Same-Day Settlement</b>	Financial institutions in western Canada can settle later in the day instead of waiting until the following morning; reducing risk involved with providing provisional credit
	<b>Better Customer Experience</b>	Financial institutions can provide faster payment solutions to their customers

Figure 23: Selection of Faster Payments Use Cases

---

### **More Efficient**

An effective transaction goes beyond its speed; it also requires complementary rules and regulations to ensure efficient processing of funds. It is important for transferred funds to be accessible to the recipient as they are received, and Canadian businesses and consumers are seeking more efficient payments to address these delays in fund availability. New requirements delivered through Modernization will ensure funds availability within two hours through AFT and even shorter timelines for RTR. These faster clearing mechanisms will provide enhanced value to customers, and increases financial institutions' opportunity to deliver funds on the same day.

Increased efficiency will also be driven through:

- Elimination of manual reconciliation processes via increased automation and machine-readable files
- Introduction of overlays allowing payments to be embedded within contexts outside traditional banking channels, providing a frictionless commerce experience for consumers
- Digitization of payments and elimination of paper-based payment items
- Harmonization of all messaging to eliminate the need for reconciliation between different payment types (see Interoperability section)

### **Richer Data**

With the digitization of the economy, businesses and consumers are increasingly dependent on having richer, more immediate data. From consumers who want to better manage their personal expenses, to large corporates that want to automate their invoice reconciliation processes, to financial institutions that want better risk management, data is the lifeblood of the digital economy.

To provide Canadians with richer data, Payments Canada has committed to adopting ISO 20022 across all three of its core payments platforms (i.e., Lynx, SOE, and the RTR). ISO 20022 is an international messaging standard that is designed to harmonize existing payments messages, and eliminate regional and contextual nuances that introduce unnecessary complexity to both domestic and international payments. ISO 20022 is likewise a 'data-rich' standard that allows the sender to include a wide-range of structured and unstructured messages along with the payments – including invoices, unique identifier numbers, and even URLs. ISO 20022 will provide increased remittance data with payments and improve the way payments data is structured, both key to allowing Canadian businesses, consumers, governments, and financial institutions to initiate, receive, and reconcile electronic payments efficiently.

### **Key Benefits of Richer Data for the Payment Systems**

#### **Enhanced Payment Clarity**

- Provides more context about payments and parties involved, simplifying the location of desired information and avoiding confusion over payment purpose

#### **Enhanced Regulatory**

- Provides information, rigor, and granularity required for regulatory, fraud, AML, KYC compliance, reporting, and audit activities

### Enables Automation

- Enables straight-through processing of payments
- Consistent and precise data structure simplifies screening processes and enables automated gathering/extracting of key data for regulatory, fraud, AML, KYC

### Greater Efficiency

- Reduces cost and effort associated with managing and supporting multiple standards
- Reduces or eliminates costs associated with paper-based payments (e.g., paper, printing, storage)
- Reduced cost for data-rich electronic payments versus alternatives (e.g., EDI)
- Reduces or eliminates need for manual inquiry about payment details and saves significant effort and costs across the entire payments ecosystem, both for users (e.g., consumers, businesses, government) and for financial institutions and payments service providers who respond to inquiries, trace the payments, and process exceptions

### New Revenue Opportunities

- Provides new opportunities to drive revenue through new products/services, increased analytics, improved customer relationship management, etc.

### Error Reduction and Simplified Error Correction

- Reduces error rate, simplifies identification and interpretation of errors, and reduces error inquiry and associated costs versus freeform and proprietary messaging formats

### Selection of Richer Data Use Cases

Payments Canada has identified several use cases to illustrate potential scenarios where the ecosystem may benefit from richer data; below is a sample set as they apply to various ecosystem players.

Stakeholder	Use Case	Scenario
CONSUMERS	Electronic Rent Payment	A tenant can make electronic rent payments to her landlord that include all the data fields she used to include on her cheques (e.g. purpose, rent month, apartment number)
	Transparent Tax Payment	A citizen makes a last-minute income tax payment and is instantly notified that their payment was received and reconciled against their account before the deadline
	Payment Inquiry	An unrecognized credit appears on Lucy's online banking statement. Instead of calling her bank to inquire, she simply clicks on the item, revealing that it is an income tax credit from the government
SMALL AND MEDIUM BUSINESSES	More Options for Data-Rich Payments	A small business owner now has multiple options for making data rich payments that meet his cost and timing needs. He no longer relies exclusively on cheques.
	Paying Multiple Supplier Invoices	A small business owner pays multiple invoices to her supplier using a single electronic payment, including information from each invoice in the same payment message. This eliminates the need to send and reconcile multiple payments.
	Data-Rich Payroll	A small business pays its employees, including information from the employees' pay stubs with the payment

Stakeholder	Use Case	Scenario
<b>LARGE CORPORATES</b>	<b>Automated Invoicing and Payment</b>	A large corporate uses an ISO 20022 message to fully automate its invoicing processes from the disbursement of invoices, to the release of finances, to reconciliation against invoices
	<b>Paying Multiple Supplier Invoices</b>	A large corporate pays multiple invoices to their supplier using a single electronic payment, including information from each invoice in the same payment message. This eliminates the need to send and reconcile multiple payments.
	<b>Straight-Through Processing</b>	An insurance company receives a data-rich insurance premium payment that automatically reconciles in its accounting system against the invoice that was paid
	<b>Interoperability</b>	A large multinational corporation gains cost and effort efficiencies using a single payment messaging standard across its global operations
<b>GOVERNMENTS, EDUCATION INSTITUTIONS AND NGOs</b>	<b>Bundling Social Service Payments</b>	A government agency bundles multiple social service disbursements into a single payment with all the information needed to understand the payment breakdown
<b>REGULATORS</b>	<b>Increased Regulatory Compliance</b>	Regulated industries are better able to meet their compliance requirements thanks to increased and more structured data with payments, providing the required information, rigor, and granularity
	<b>Identifying Illegal Activity</b>	Regulators are better able to spot illegal activity such as money laundering and terrorist funding due to increased information on all parties involved in a payment
<b>VENDORS, FINTECHS AND INNOVATORS</b>	<b>Providing a Seamless Experience</b>	A payment software vendor offers an ISO 20022-enabled platform, offering a more seamless experience and making it easier for their customers to adopt and integrate with their solution
	<b>New Data-Related Offerings</b>	A software vendor can leverage the ISO 20022 data to offer new features and services to its clients
	<b>New Market Opportunities</b>	A data analytics startup partners with a financial institution to jointly offer new data services to banking customers
<b>FINANCIAL INSTITUTIONS AND PSPs</b>	<b>Reduced Inquiries</b>	Financial institutions save significant time and effort in addressing inquiries about payment details
	<b>New Data-Related Offerings</b>	A financial institution can leverage the ISO 20022 data to offer new features and services to its clients

Figure 24: Selection of Richer Data Use Cases

### **Facilitating Ecosystem Adoption of ISO 20022**

Payments Canada recognizes that the benefits of ISO 20022 depend on widespread adoption of the standard across the Canadian economy. As such, Payments Canada is leading the effort to introduce ISO 20022 across all ecosystem participants and drive ubiquity for data richness in payments throughout the Canadian market. Efforts to drive and facilitate ecosystem adoption include:

- Setting a deadline for ISO 20022 adoption between financial institutions

- 
- Encouraging early adoption across the ecosystem by raising awareness and interest, engaging ecosystem participants, facilitating knowledge transfer, and providing operational support
  - Acting as the knowledge leader for ISO 20022 in Canada by developing and publishing educational and training resources
  - Articulating the benefits of ISO 20022 and working with ecosystem participants to help realize the benefits

## **More Convenient**

Canadian businesses and consumers want their payment experiences to be simple, flexible, and convenient, to the point of being “friction-free.” Exposure to innovative new service providers, like Uber and Amazon ‘1-Click Checkout,’ have set a new standard for friction-free payments. To address these needs, Modernization will enable more convenient payments through: (A) Proxy/Alias Services, (B) Notification/Confirmation Messages, (C) Overlay Services and APIs.

### **A. Proxy/Alias Services**

Proxy/alias services will allow Canadians to make payments to a recipient using information they already have such as an e-mail address, telephone number, or even social media identifiers rather than using long and complex bank account information. This eliminates the need to use, store, or ask for a recipient’s account details to make a payment. Businesses of all sizes also seek the ability to safely route payments using publicly available information. This feature would be particularly valuable for governments and businesses that still rely heavily on cheque payments due to the challenges and privacy concerns associated with capturing account numbers. Key benefits are further detailed below:

#### **Enhanced User Experience**

- Simplified payment experience through use of proxy identifiers instead of complex account information
- Ability to make payments using publicly available identifiers like a social media handle simplifies the user experience and alleviates privacy concerns

#### **Protects Sensitive User Information**

- Use of proxy identifiers and aliases instead of sensitive or private banking information protects end-user account information

### **B. Notification/Confirmation Messages**

Modernized payment systems will provide Canadians more visibility into the status of a payment from initiation to completion, with notifications of when recipients receive funds. This functionality will be especially helpful for recurring and time-sensitive payments. Businesses will no longer have to expend time and effort to manually inquire into the status of wire payments. Businesses and governments will benefit from transaction tracking since notification of returns and errors from financial institutions can currently take several days and, in some instances, an error may not be apparent until a payee calls to inquire about a missing payment. Financial institutions will have more transparency into payment progress and status, and the ability to track a payment through processing stages of domestic and corresponding bank networks. This will allow financial institutions to provide an improved customer experience. The benefits are further detailed below:

---

### **Greater Transaction Transparency**

- More visibility into the status of a payment from initiation to completion, including notifications of receipt
- Early notification of payment failure or delay results in quicker issue resolution
- Improved user experience through increased certainty and confidence that a payment has been successfully received

### **Effort and Cost Savings**

- Reduces or eliminates need for manual inquiry about the status of payments and saves significant effort and costs across the entire payments ecosystem, both for users (e.g., consumers, businesses, governments) and for financial institutions and payments service providers who respond to inquiries, trace the payments, and process exceptions

### **C. Overlay Services and APIs**

Payments Canada views the RTR as a platform for innovation and is excited about the opportunities that could be enabled for Canadians. As such, Payments Canada will be seeking to proactively engage with an innovative community (financial institutions, Fintechs, technology companies, corporates, etc.) to facilitate access to new capabilities. While RTR overlay services are covered more extensively in Section 2.5 of this document, it is worth noting that new value-added products and services are expected to come to market that will significantly increase convenience in making and receiving payments.

#### **CASE STUDY: REQUEST TO PAY**

The new RTR with overlay services will enable capabilities like request-to-pay (RtP). RtP allows a Payee to send pre-populated payments request messages to a Payor. The Payors in turn could accept or decline the pre-populated message; if the Payor 'accepts', the transaction initiates and automatically sends the agreed amount to the Payee in real-time.

Practically speaking, how would this look? A large power utility could send an electronic bill to their customer via email. Included in that email would be a pre-populated payments messages with amount, invoice information, and pre-populated payment instructions. The customer could click on the payments message, authenticate their identity (using an email address, phone number, or other unique identifier), and securely initiate the payment. Once the payment is initiated, the funds would be transferred in real-time from the customer to the utility company's account. Once the payment is complete, the customer would automatically receive a confirmation that the payment had been successfully received by the utility company, and that their account had been credited.

### **Interoperable**

Canada is experiencing a growing need for a standardized messaging scheme. The standards currently relied upon for domestic payments in Canada are not consistently applied by all financial institutions and businesses, resulting in high cost and effort to maintain multiple standards and difficulties with interoperability. Canadians have acclimatized to a payments ecosystem where they have limited options for making payments with the features they desire – speed, low cost, data

---

richness, irrevocability, etc. Adopting ISO 20022 across all payment systems in Canada will enable data-rich, interoperable payments that are “rail-agnostic” with the payment method chosen to match the needs of the customer. This “rail-agnostic” approach abstracts the mechanics of the payment from the user experience, allowing financial institutions and customers to focus on the parameters of the payment (e.g., speed, cost efficiency) rather than the method of transfer (e.g., wire, real-time payments).

In addition to internal pressures to adopt ISO 20022, increased globalization requires a payments ecosystem that is interoperable for cross-border transactions. Currently, financial institutions and their customers employ workaround solutions (such as message conversion or translation) to overcome these limitations. Canada must adopt ISO 20022 to keep up with our main trading partners and enhance our position as a trading nation. The benefits are further detailed below:

#### **“Rail Agnostic” Domestic Payments**

- Simplifies payments, offers a richer set of viable payment options, and abstracts the mechanics of the payment from the user experience, allowing financial institutions and customers to focus on the parameters of the payment (e.g., speed, cost efficiency) rather than the method of transfer (e.g., wire, real-time payments)

#### **Enhanced Global Interoperability and Relevance**

- Helps Canadian businesses and financial institutions operate internationally and remain globally competitive
- Simplifies international payments, reduces risk of error or confusion in processing international payments
- Reduces friction for multinational corporations making and reconciling payments across borders
- Lowers barriers to entry for small/medium-sized businesses looking to expand internationally

#### **Greater Efficiency**

- Reduces cost and effort associated with managing and supporting multiple standards
- Simplifies access to and integration of vendor payments software (especially for small businesses)
- Simplifies onboarding for billing
- Simplifies mapping of data between proprietary layouts, message formats, and other industry standard syntaxes using ISO 20022 as integration layer

#### **Synchronizing ISO 20022 with Major Trading Partners**

Synchronization of the ISO 20022 messaging standard across geographies is crucial to driving global interoperability, facilitating trade across borders, and fully realizing the benefits of ISO 20022. In addition to adopting ISO 20022 across all Canadian payment platforms, Payments Canada is working to synchronize messaging standards with other regions, in particular, major trading partners (e.g., U.S., U.K., Europe), through participation in SWIFT’s global synchronization efforts, and close engagement with U.S. counterparts (U.S. Federal Reserve, The Clearing House, NACHA).

#### **Greater Security, Risk Management and Privacy**

Security, risk management, and privacy are extremely important for a modern payments ecosystem and for maintaining the trust and confidence of Canadians. Through Modernization, Payments Canada will deliver best-in-class capabilities into the systems.

---

## **Security and Privacy**

Canadians expect and assume that the ecosystem underpinning their financial services is compliant with global standards and protected by best-in-class security and privacy measures. As cyberattacks, data breaches, and fraudsters become more frequent and sophisticated, the systems protecting Canadians and their financial data need to stay ahead of the curve. Payments Canada is responding to the needs and expectations of Canadians by building a flexible and secure payments infrastructure with the ability to adapt to ever-changing threats and continuously deliver the highest standard of security, risk, and privacy protection as needs evolve. In addition, Payments Canada will enable and deliver leading practices and technologies. One such example is tokenization, where users' account numbers are replaced with an alternate limited-use "token" or proxy string of numbers. The secure, encrypted token flows through the payment system in the same way as an actual account number, meaning that should anyone break into the chain, they would obtain a useless token and no account information. Tokenization and other leading privacy and security measures will play a key role in protecting sensitive payment information against credential theft and limiting the access to and transmission of end-user information.

### **Prevents Unauthorized Access to Information or Value**

- Protects against credential theft, limits access to and transmission of end-user information, and devalues compromised or intercepted data

### **Increased Security for Card-not-Present Transactions**

- Provides added level of security for card-not-present transactions such as online payments that are not protected by EMV

### **Enhanced Confidence in Payments Ecosystem**

- Enhances Canadians' confidence in core systems and fosters confidence in the broader payments ecosystem

## **Risk Management**

The Modernized payments ecosystem will improve risk management by providing increased transparency into payments and leveraging centralized fraud and risk management capabilities. These capabilities will improve identification of suspicious activities and enhance error detection and prevention across the ecosystem. All systems will comply with the Bank's risk management. In addition, new state of the art technology will reduce the technical risk associated with legacy systems, ultimately providing a more reliable and scalable platform for the Canadian payments ecosystem. The benefits are further detailed below:

### **Improved Risk Management**

- Increased visibility to transactions at the ecosystem level; ability to see macro-level trends
- Improved ability to monitor, detect, and prevent illegal activities such as fraud, money laundering, and terrorist funding
- Adds a layer of defense above and beyond what financial institutions provide

### **Reduced technology risk**

- Reduced technology risk associated with legacy payments infrastructure
- Improved system up-time
- Enhanced scalability and adaptability to new use cases and system demands

---

### **Alignment with the Bank's risk standards**

- Lynx will meet Bank's risk management standards for designated systemically important FMIs
- SOE and the RTR will meet Bank's risk management standards for Prominent Payment Systems

### **Enhanced error detection and prevention**

- Increased automation for error detection and prevention with alerts and error checking tools

### **Next Steps**

Through this document, a preliminary view of the benefits of Modernization is articulated. In the coming months and years, Payments Canada will continue to work with the industry to help Canadian businesses and consumers realize the benefits of Modernization. Planned efforts include:

- Publish benefits, use cases, and other collateral on the Payments Canada website ([payments.ca](https://payments.ca)) along with additional tools and training materials
- Engage with the industry to further refine our understanding of benefits and develop additional use cases
- Encourage early adoption across the ecosystem by raising awareness and interest, engaging ecosystem participants, facilitating knowledge transfer, and providing operational support

---

## 6. APPENDIX

### 6.1 Reference Material

1. Modernizing Canadian Payments: A Vision for the Canadian Payments Ecosystem (April 2016) ([www.payments.ca/sites/default/files/vision-canadian-payments-ecosystem-reader.pdf](http://www.payments.ca/sites/default/files/vision-canadian-payments-ecosystem-reader.pdf))
2. 2016 Industry Roadmap and High Level Plan (December 2017) ([www.payments.ca/sites/default/files/roadmap\\_whitepaper\\_en.pdf](http://www.payments.ca/sites/default/files/roadmap_whitepaper_en.pdf))

### 6.2 Glossary

Term	Description
<b>Access</b>	The right of or opportunity for an institution to use the services of a particular payment system to exchange, clear and/or settle payments on its own account or for customers
<b>Access Criteria</b>	The minimum conditions that an entity would need to satisfy to participate directly (or indirectly) in a payment system. Access criteria may differ depending on what role the entity will perform as a participant in the system (e.g., exchange of payment messages, clearing or settlement with the central bank)
<b>AML</b>	Anti-Money Laundering; legal requirements by which financial institutions globally, and many non-financial institutions, are required to identify and report transactions of a suspicious nature to the financial intelligence unit in the respective country
<b>Authentication</b>	The process by which the identity of a User who wishes to access a system or service is confirmed. Authentication protocols may take many forms depending on whether validation is being done in person or electronically
<b>Availability of Funds</b>	The point at which a payee can withdraw and use funds (which may occur before the participating financial institutions settle)
<b>Batch Retail Payment Systems</b>	Systems most commonly used to clear and reconcile direct credit and direct debit payments. Batch refers to the transmission or processing of a group of payment orders and instructions as a set at discrete intervals of time

<b>Term</b>	<b>Description</b>
<b>Batch Total Entry Systems</b>	Payment systems characterized by bilateral exchanges made outside of a central system, and the separate entry of batch totals into the clearing system to support settlement
<b>Beneficiary Participant</b>	The Participant that receives a payment on behalf of an end user (Payee) / Indirect Participant or its own account
<b>Clearing</b>	Commonly understood to mean the process of transmitting, reconciling and, in some cases, confirming payment orders prior to settlement, possibly including the netting of instructions and the establishment of final positions for settlement. For the purposes of ACSS, it means the reconciliation of payment items that were exchanged and the calculation of net totals for settlement
<b>Collateral</b>	An asset or third-party commitment that is used by a Participant to secure an obligation vis-à-vis a collateral taker
<b>Core Payment System or Infrastructure</b>	The fundamental technology, rules and processes needed by any payment system
<b>Decentralized Systems</b>	Payments are exchanged, cleared and settled through multiple point-to-point systems, where they are routed and validated by the Participants
<b>Deferred Net Settlement (DNS)</b>	A settlement system whereby final settlement occurs at the end of a pre-determined settlement cycle
<b>Direct Clearer</b>	A CPA member (other than the Bank of Canada) that, on its own behalf, exchanges payment items and makes entries directly into the ACSS.
<b>Direct Participant</b>	An entity (e.g., financial institution) that meets the applicable access criteria to access a payment system directly (without sponsorship or agency agreement with other bank/payment services provider)
<b>Directory Services</b>	Provides directory services, which are lists to provide routing information to facilitate the exchange of payments (e.g., Payment Canada's Financial Institution File (FIF) and Corporate Creditor Identification Number (CCIN) database)
<b>End-User</b>	A person or entity that holds a transaction account at a Participant. This includes individual consumers, businesses, government and other organizations that make and receive payments.
<b>Exchange</b>	The delivery and receipt of payment instructions, which would result in a debit and credit being posted to the accounts of the Payor and Payee
<b>Finality of Payment</b>	Payment cannot be revoked/reversed by any party involved
<b>Good Funds</b>	Funds are delivered with finality to payee when the payee financial institution has certainty of credit from the payor

<b>Term</b>	<b>Description</b>
<b>HVPS</b>	High-Value Payment Systems, the technology, rules and processes that facilitate typically large-value inter-financial institution transfers with finality
<b>Indirect Participant</b>	An entity that cannot meet the applicable eligibility criteria or for business reasons accesses the core payment system through an agency agreement (i.e., sponsorship) with a Direct Participant
<b>Interoperability</b>	Ability for payments to be processed (exchanged, cleared and settled) across multiple systems or jurisdictions (e.g., cross-border) without manual assistance; generally facilitated by adoption of common standards and/or technical compatibility
<b>LVTS</b>	Large Value Transfer System; a wire system that facilitates the transfer of funds between participating financial institutions in real-time with finality of payment and certainty of settlement
<b>Non-Financial Institution Participant</b>	A subset of the participants that exclude all the financial institutions (banks, credit associations, trust and loan companies, etc.)
<b>Non-Functional Testing</b>	Testing methodologies and procedures that are conducted to verify the way that a system operates
<b>Onboarding</b>	The activities needed to integrate a new participant or remove an existing participant from Payments Canada's systems
<b>Operator</b>	Entity that sets the rules and broader legal framework for a payments product, and defines roadmap as part of the product development. Also selects and retains control over the service provider, ensuring agreed service levels are met. Operator also controls pricing for the participants.
<b>Originating Participant</b>	The participant that makes a payment on behalf of an end-user (Payor) / Indirect Participant or itself
<b>Overlay Service</b>	Component of the RTR functional architecture that relies upon the RTR but is modular, more responsive to market needs and directed at both participants and payment system users. Can be provided by a Direct or Indirect Participant. May include third party services that do not require a connection to the system itself. Also known as the service layer
<b>Overlay Service Provider</b>	An entity that provides Overlay Services. Can include a Direct and Indirect Participant
<b>Participant</b>	An entity that participates in a payment system and ordinarily offers payment products and services to users.
<b>Payee</b>	The end-user (person or organization) who receives funds when a payment item is credited to their account

<b>Term</b>	<b>Description</b>
<b>Payment Service Providers</b>	A person or an entity that provides services directly to end users such as consumers and businesses/corporates, banks or other entities to support exchange, clearing and settlement services
<b>Payments</b>	Transfers of value and data between parties
<b>Payor</b>	The end-user (person or organization) who authorizes their financial institution to debit their account for the amount of a payment item
<b>Proxy</b>	Alternative means of routing transactions using a mapping from account to non-account information
<b>Proxy Database</b>	Manages processes and a database that facilitates the use of an alternative means of routing transactions using a mapping from account to non-account information such as email addresses or phone numbers rather than banking details to send payments
<b>Real-Time Payment</b>	Payments that are exchanged and cleared and funds are available to end users instantaneously or no longer than one minute. Near-real-time is used to describe processes that take place in under three minutes (but longer than one minute)
<b>RTR</b>	Term used to describe real-time ISO 20022-enabled payments capability for consumer and business payments.
<b>Risk Model</b>	Risk Model is an umbrella term for the way a system is designed to manage risks such as Liquidity, Credit, Settlement and Operational risks
<b>Settlement</b>	An act that discharges obligations in respect of funds between two or more parties
<b>Settlement Optimization Engine</b>	A component of the core clearing and settlement system that will enable the settlement of lower value items/payment schemes to be migrated to the new system, maintaining, to the greatest degree possible, the high efficiency of multi-lateral net settlement currently delivered through the ACSS
<b>SWIFT</b>	Society for Worldwide Interbank Financial Telecom, a messaging network that financial institutions use to securely transmit information and instructions through standardized messages
<b>Tokenization</b>	The process of replacing sensitive data with unique symbols while retaining all essential information without compromising its security
<b>User</b>	Individuals and organizations, including businesses, government and other organizations, that use the payment products and services offered by payment system's participants to make payments to another party