



**PAYMENTS  
CANADA**

# MODERNIZATION TARGET STATE

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

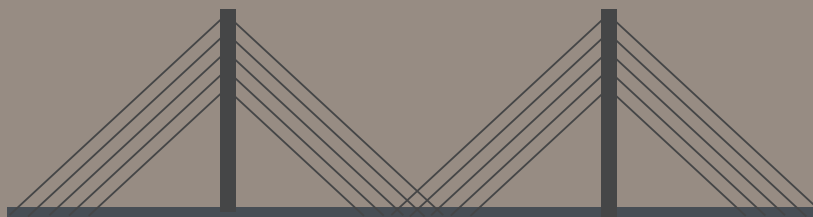
COMPANION READER  
DECEMBER 2017

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

# OVERVIEW

Payments Canada is leading an industry-wide initiative to modernize Canadian payments. Guiding the journey are the needs of Canadians, including consumers, financial institutions, corporates, small businesses, start-ups, regulators, and governments. Those needs were identified through a detailed and collaborative process to develop the Vision for the Canadian Payments Ecosystem published in April 2016 and followed up by an Industry Roadmap & High Level Plan for meeting those expectations through Modernization, published in December 2016.

*The Modernization Target State document provides a more detailed view of the program, including descriptions of modernized systems and their fundamental support structures, such as risk and regulatory considerations, and access models. It also provides a view to the target state for Modernization, the way modern systems will integrate, possible migrations of payment types and the anticipated benefits for Canadian businesses and households.*



## About Payments Canada

Payments Canada ensures that financial transactions in Canada are carried out safely and securely each day. The organization underpins the Canadian financial system and economy by owning and operating Canada's payment clearing and settlement infrastructure, including associated systems, bylaws, rules and standards. The value of payments cleared and settled by Payments Canada in 2016 was nearly \$50 trillion or \$201.5 billion every business day. These encompass a wide range of payments made by Canadians and businesses involving inter-bank transactions, including those made with debit cards, pre-authorized debits, direct deposits, bill payments, wire payments and cheques.



# THE VISION FOR THE CANADIAN PAYMENTS SYSTEM

The vision for the Canadian payments ecosystem is a modern payment system that is fast, flexible and secure, promotes innovation, and strengthens Canada's competitive position. The target state is designed to achieve this vision and to provide the following high-level benefits for Canadians.



## Fast Payment Options

A modern system should make near real-time payments available in all cases where it is beneficial.



## Data-rich Payments

In Canada, ISO 20022 is being pursued as the global message standard to provide expanded and standardized information with each payment.



## Transaction Transparency

Notifications to payor and payees should provide updates on the status of payments.



## Easier Payments

Payments should be possible with just an e-mail address, telephone number or even a social media handle.



## Activity-based Oversight

Rules and regulations should focus on services provided, instead of the type of institution that provides them.



## Open and Risk-based Access

Foster competition and innovation, and clearly define requirements for payment system access - without compromising security.



## A Platform for Innovation

The payments system should be flexible and adaptable, providing a platform for innovation, decreasing costs and delivering ongoing efficiencies to payors and payees.



## Cross-Border Convenience




Consumers and businesses should have access to practical and convenient methods to make payments to those in other countries.



# PAYMENTS SYSTEMS OVERVIEW

Payments Canada believes there is a need to support three core payment systems in Canada for the foreseeable future: a high-value payments system and two systems that address smaller, higher-volume payments.

The three systems will coexist and effectively complement one another to serve their intended purpose, providing a richer set of viable payment options to meet the needs of Canadians.

 <b>LYNX</b>	 <b>SOE</b>	 <b>RTR</b>
<b>High-Value Payments</b>	<b>Batch Payments</b>	<b>Real-Time Rail</b>
<b>1</b>	<b>2</b>	<b>3</b>
<ul style="list-style-type: none"><li>• Lynx is a high-value payments system that will process large value time critical payments in real-time with settlement finality</li><li>• Lynx will replace the current Large Value Transfer System (LVTS)</li><li>• Lynx will be designed to comply with strict risk management standards outlined in the Bank of Canada's standards for Systemically Important Payment Systems that are based on the Principles for Financial Market Infrastructures</li><li>• Lynx will be built to support ISO 20022 and allow for future migration to this standard</li></ul>	<ul style="list-style-type: none"><li>• SOE is a batch payment system for the clearing of lower valued, less time-sensitive electronic and paper-based payments</li><li>• SOE will replace the current batch payments systems: Automated Clearing Settlement System (ACSS) and U.S. Bulk Exchange (USBE)</li><li>• Broader access to the SOE will be carefully examined, including considering unbundling individual payment streams and decoupling exchange from clearing and settlement</li><li>• SOE will be designed to provide better risk management and to comply with risk management standards defined by the Bank of Canada's standards for a Prominent Payment System</li><li>• One of the prominent batch payment streams, Automated Funds Transfer, will be enhanced by migrating to the ISO 20022 messaging standard, an additional exchange window to better support all Canadian time zones, and faster funds availability</li></ul>	<ul style="list-style-type: none"><li>• The real-time payments system is a new, 'always on' (i.e. 24/7/365) system that facilitates the real-time delivery of low-value payments with immediate funds availability for the recipient</li><li>• The system will deliver funds in a matter of seconds, providing a real-time clearing capability for retail and commercial use cases</li><li>• Simplifies the payment initiation experience by allowing users to make payments using aliases (e.g., mobile number, email, or other identifiers) without the needing to know the beneficiary's account number</li><li>• Satisfies the need for real-time clearing, rich remittance information through ISO 20022, and enhanced functionality to better serve consumers, businesses and government for lower value payments</li><li>• Will support the development of overlay services - new offerings built atop the system's core infrastructure - serving as a platform for innovation for new services</li></ul>

**Note:** The names RTR (Real-Time Rail) and SOE (Settlement Optimization Engine) are currently being used for project delivery purposes only and will be changed.



# REGULATORY FRAMEWORK

- 1** Payments Canada's Target State will consist of three core payments systems – Lynx, SOE, and RTR – each with the appropriate risk and oversight models.
- 2** Fair, open risk-based access to facilitate innovation and promote efficiency.
- 3** For Lynx, a Real-Time Gross Settlement design with a cover-all defaulter pay credit risk model to effectively manage risk without the need for a residual guarantee from the Bank of Canada.
- 4** For SOE, an enhanced risk management framework, including managing risk from undesirable volume migration from Lynx.
- 5** For the RTR, a cover-all defaulter pay risk model is required to facilitate open, risk-based access.

It is expected that the regulatory environment in which Payments Canada operates will evolve. Our modern payment systems must be flexible enough to be able to adapt to evolving regulatory standards.



# ACCESS MODEL

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Payments Canada is proposing a system-specific approach for risk-based access.

Payments Canada's Vision for modern payments called for open and risk-based access to the payments systems to foster competition and innovation, without compromising safety and soundness.

## The system access design is guided by:

### 1 Bank of Canada Risk Standards:

Objective, risk-based access criteria that permit fair and open access – subject to appropriate risk controls – and are consistent with relevant Bank of Canada regulatory requirements.

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### 2 Payments Canada and Government of Canada's public policy objectives:

Payments Canada has a legislated duty, under the Canadian Payments Act, to promote the efficiency, safety and soundness of its clearing and settlement systems and take into account the interests of users. More broadly, the Government of Canada's stated public policy objectives for the payments system include safety and soundness, efficiency and meeting the needs of Canadians.

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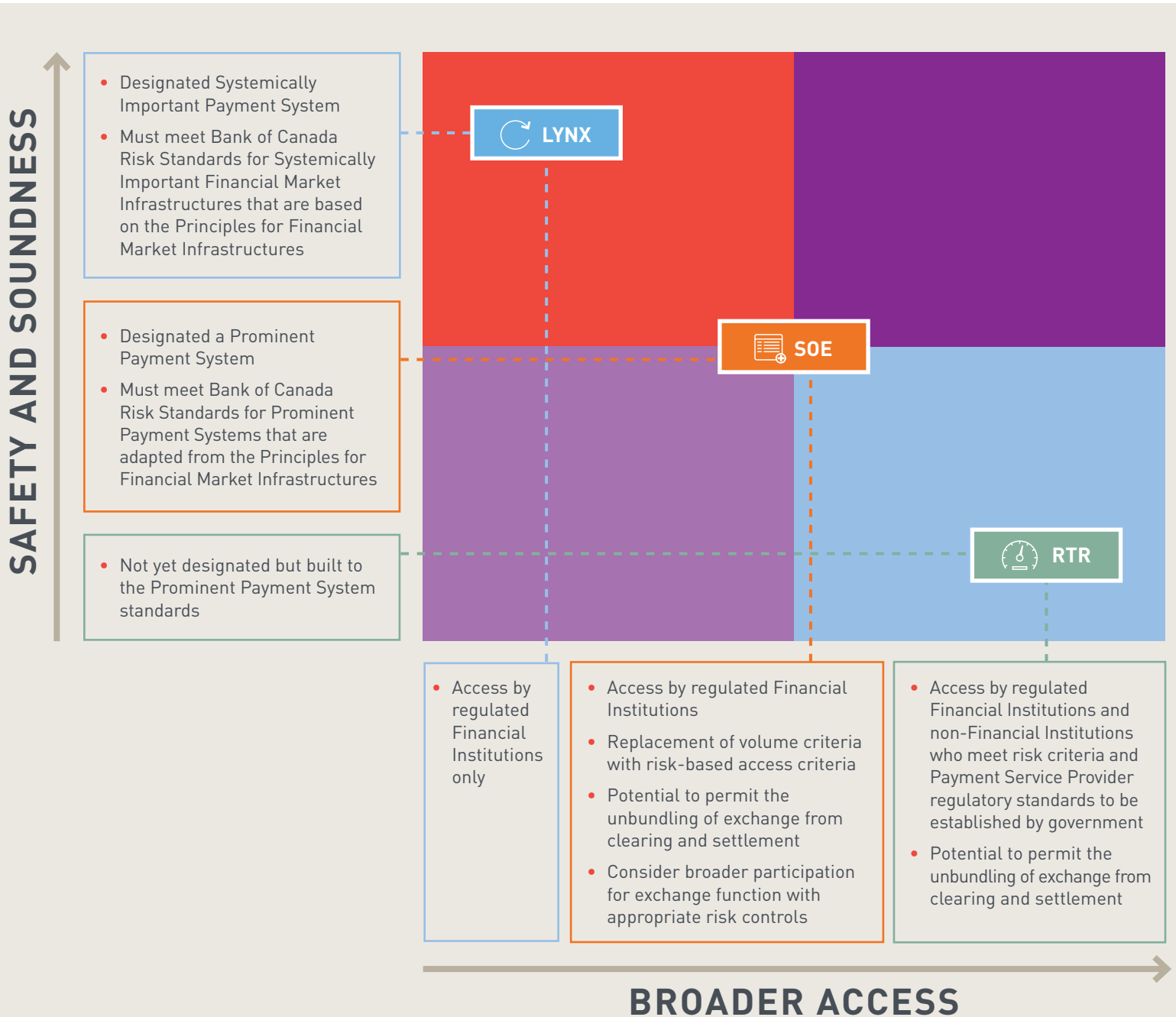
### 3 The following assumptions:

- The access model (and related systems designs) and compliance frameworks will seek to mitigate identified risks and liability considerations of Payments Canada and its members related to more open access.
- Payments Canada will continue to carry out its core functions and will not perform the functions of a prudential or consumer protection regulator.
- Detailed risk-based access criteria will be developed based on the nature of the risks in each specific payments system.



# PROPOSED FRAMEWORK FOR SYSTEM ACCESS

Access requirements will differ across the three systems, each coupled with adherence to robust risk management standards to ensure safety and soundness appropriate for the system's relative risk and designation (i.e. Systemically Important Payment System versus Prominent Payment System).





# LYNX: HIGH-VALUE PAYMENTS SYSTEM

## OVERVIEW OF LYNX

Lynx is a high-value payments system that will process large value time critical payments in real-time with settlement finality. Lynx will replace the Large Value Transfer System (LVTS)

**Settlement Model:** Real-Time Gross Settlement

**Risk Model:** Cover all defaulter pay without central bank's residual guarantee

**Access:** Expected to remain consistent with current LVTS access

**Payment Processing:** Real-time, final and irrevocable

## LYNX CAPABILITIES

### Liquidity Management

- Use of a single liquidity pool
- Use of Liquidity Savings Mechanisms (LSMs) for bilateral and multilateral netting of Non-urgent Payments
- Ability to allocate liquidity for specific payment types
- Ability to reserve liquidity for specific payments (e.g., settlement of CDSX for securities or CLS for foreign exchange)

### Payment Processing

- Support for Urgent and Non-urgent Payments (maintaining the benefit of netting)
- Increased automation with High-Availability Banking System (HABS)
- Real time risk controls (e.g. bilateral limits and caps)
- Ability to warehouse future dated payments
- Support MT messages for initial go-live
- Support ISO 20022 (MX) for future phases

### System Administration

- Enhanced reporting capabilities including historical data, liquidity, and queue management
- Real-time system monitoring and notifications
- Improved resiliency capabilities
- Better/more automated testing facilities
- Support for API integration and connectivity
- Support for extended business hours for future phases





## SUPPORT FOR URGENT AND NON-URGENT PAYMENTS, AND LIQUIDITY SAVINGS MECHANISMS

Once a payment has been initiated and submitted to Lynx, it is validated against predefined business rules. If it passes validation, it is routed based on payment type (Urgent or Non-urgent). The validated payments are then checked against risk controls depending on the payment type.

### LYNX MESSAGE TYPES

#### i. Urgent Payments

Sent for immediate settlement, and in the process, can check liquidity saving mechanisms for offsetting payments (if available with minimal settlement delay). Risk controls are then applied to determine if there is sufficient liquidity allocated to urgent payments to be able to proceed.

#### ii. Non-urgent Payments

Placed in an LSM for netting, although settle on gross basis. These payments are grouped bilaterally or multilaterally and the 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 settle the payments.





# SOE: HIGH-VOLUME, BATCH PAYMENTS & MESSAGING SYSTEM

## OVERVIEW OF SOE

SOE will replace the ACSS and USBE applications supporting the clearing of batch paper and electronic payments, and adhere to the Bank of Canada’s Prominent Payment System (PPS) standards.

**Settlement Model:** Deferred Net Settlement (DNS)

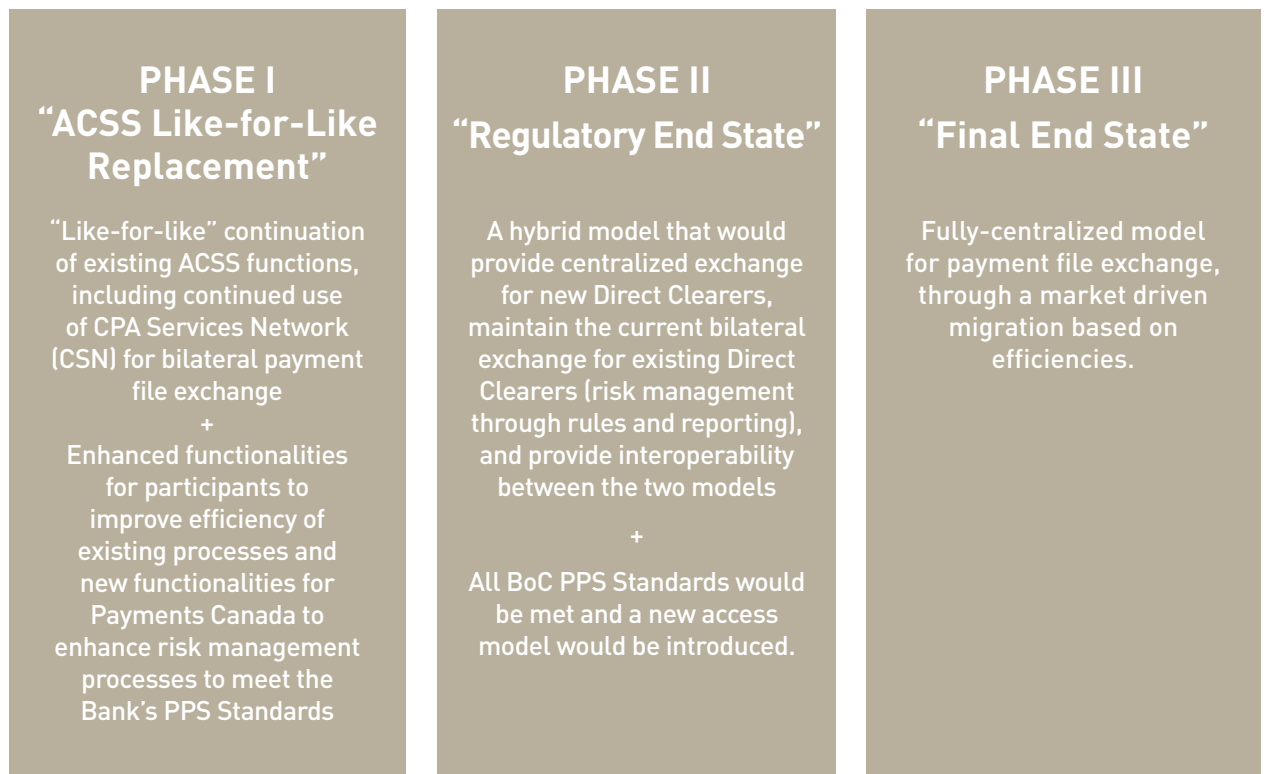
**Risk Model:** Cover-one survivor pay

**Access:** Expanding the access model for the SOE will be carefully examined, including: removal of the volume criteria for participants, unbundling of participation across payment streams, and the decoupling of exchange from clearing and settlement

**Payment Processing:** Batch processing

## SOE will be released in three phases

The exact scope of the three SOE phases remains under examination. Further consultations will be held with Bank of Canada and Payments Canada members. The three-phased approach presented below illustrates a potential option, representative of thinking at the publication time of this document.



## ENHANCEMENTS TO AUTOMATED FUNDS TRANSFER

Changes to the Automated Funds Transfer (AFT) batch process will ensure a more uniform experience for Canadians across all time zones and ensures that funds are available within two hours for same day AFT credits destined to Direct Clearers and participating Indirect Clearers. Enhancements will be delivered in two phases with the purpose of improving uniformity and processing speed across Canada.

### PHASE I

- In September 2018, a 3rd daily exchange window will be added (9 p.m. Eastern Time)
- As of October 2018, funds availability to payees will be made within two hours of exchange deadlines - Clearing Agents will be required to make AFT credit transactions to participating Indirect Clearers available as soon as possible, but no later than two hours following each exchange deadline
- Direct Participants will be required to send monthly volume data to Payments Canada
- Additional exchange windows and even faster funds availability will be considered once the business benefit evaluation of Phase I and II is completed

### PHASE II

- The ISO 20022 payment message standard will be required for all AFT transactions, following a period of market-driven adoption
- Direct and Indirect Clearers will be required to:
  - Pass along any remittance data, unaltered, to the next Financial Institutions in the payment chain or end users
  - Support the use of the Payments Canada defined PAIN (payment initiation) messages within their client message portfolio. Recommended use of CAMT messages (cash management reporting)





# RTR: REAL-TIME RAIL

## OVERVIEW OF THE RTR

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

**Settlement Model:** There are two options under evaluation for the settlement model.

**Risk Model:** A 'cover-all' defaulter pay model is being considered

**Access:** Open, risk-based approach wherein exchange and settlement functionalities will be unbundled allowing for multiple participation models

**Payment Processing:** Real-time

The RTR Utility and Service Layers will consist of multiple components that function together to enable participating Payment Service Providers to offer services including:

1

Instant and irrevocable exchange and clearing of single credit transfer payment items with a robust risk model

2

Shared services that support exchange and clearing, with the initial shared service being an alias database

## RISK MODEL

Payments Canada is evaluating two options for the settlement model for the RTR: (1) real-time settlement or (2) deferred net settlement. In both options, a 'cover-all' defaulter pay model is being considered.



# RTR STRUCTURE

The real-time payments system will consist of the underlying technology platform and infrastructure that enables payments, and a competitive market for services. These services are known as Overlay Services.

## SERVICE LAYER

Overlay Services consist of customer-facing products/services developed by Payment Service Providers for the real-time exchange of payments. They will connect to the system through ISO 20022-based APIs, providing a connectivity mechanism that facilitates innovation.

## Example Potential Overlay Services

- Bill payments
- Tax remittances
- Insurance reimbursements
- Online checkout

## SYSTEM LAYER

The system includes all core payment functionalities and key enablers, such as rules and procedures, and messaging management for ISO 20022. It also includes a legal and business framework.

## Functionality

- Exchange and clearing
- Settlement
- Request-to-pay
- Legal, rule framework, and risk model
- Shared services, for example proxy database
- Integration and reporting
- Payment capacity management
- ISO 20022



# ISO 20022 ADOPTION STRATEGY

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ISO 20022 is a strategic foundational component for our modernized systems. The adoption of ISO 20022 is necessary for the development and implementation of a modernized national payments system. Therefore, ISO 20022 will be the messaging standard for the three core payment systems resulting from Modernization (Lynx, RTR and relevant SOE streams, including AFT).

**To achieve holistic ISO 20022 adoption, the following guiding principles have been identified:**

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## Common Language, Message, and Elements

- Use common messages across all systems (Lynx, RTR, and relevant SOE payments streams, including AFT)
- Align with global market practice for message usage
- Use the ISO 20022 element names and usage definitions across all payment types (batch or single credits/debits)

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## Remittance Information

- Ensure that the remittance information available is consistent across Lynx, RTR, and the relevant SOE payments streams, including AFT)

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## Version and Release Management

- Maintain the most recent version of ISO 20022 messages in our message portfolio
- Ensure that updates to the ISO 20022 messages within the Payments Canada message portfolio follow the SWIFT annual Standards Release cycle

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## Flexibility and Room for Innovation

- Ensure that Payments Canada's principles do 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 customer



# POLICY AND LEGAL FRAMEWORK



Payments Canada's core mandate is set out in the Canadian Payments Act. The organization is accountable to the Minister of Finance, and its core payment systems are overseen by the Bank of Canada in accordance with the Payment Clearing and Settlement Act. Payments Canada carries out its objectives in part through establishing by-laws, rules and standards to govern its systems, which are overseen by the Department of Finance and the Bank of Canada.

The Department of Finance plans to implement a new regulatory regime to oversee retail payments, which will apply to non-financial institution payment services providers—the expected future participants in the RTR. The Government of Canada is expected to review the Canadian Payments 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 the changes needed to support a broader membership base.

Payments Canada is focused on developing modern, flexible systems while ensuring they remain safe and sound. Each core payments system will continue to have a well-founded, clear, transparent and enforceable legal basis.

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## Payments Canada Core Mandate

Payments Canada was created through the Canadian Payments Act with a mandate to design and operate Canada's critical clearing and settlement infrastructure and establish a supporting framework of rules, standards and policies.

1

Establish and operate core clearing and settlement systems

2

Facilitate interaction between its systems and others

3

Facilitate the development of new payment methods and technologies



# POLICY AND LEGAL FRAMEWORK



## Modernization Program Policy Framework

### 1 Membership

Promote legislative changes to broaden Payments Canada's eligible membership base, including to facilitate broader access to core systems and ensure the compliance reach necessary to to enforce bylaws, rules and standards.

### 2 Alignment with new federal regulatory retail framework

Work with the Department of Finance to ensure Payments Canada's policy framework is consistent and coherent with new federal retail payments regulation to avoid overlap, confusion and gaps.

### 3 Fulfilling our facilitation mandate

Review and establish a flexible framework designed to support payment system interoperability and innovation in the ecosystem.

### 4 Appropriate use of policy tools

Refresh approach to bylaws, rules and standards to achieve greater flexibility while maintaining clarity, certainty and enforceability, and enhancing compliance oversight.





# INTEGRATED WORK PLAN – FOR THE NEXT 12 MONTHS

Several key milestones will be reached over the next 12 months that will help finalize the Modernization Roadmap.

## LYNX

- Select Application Vendor
- Collaborate with Participating Members to Develop FI Requirements
- Select System Integration and Infrastructure Hosting Partners
- Commence Close Examination and Configuration of LSMs

## SOE AND AFT

- Validate Interest in Direct Access (SOE)
- Determine Delivery Strategy (SOE)
- Define Financial Risk Model (SOE)
- Determine Same-Day Settlement Times (SOE)
- Participate in Inter-Financial Institution Testing (AFT)
- Implement AFT Phase I including required rule changes (AFT)
- Develop Migration Approach for AFT Phase II (AFT)
- Increase ISO awareness - the benefits and opportunities
- Amend existing Rules (AFT)

## RTR

- Select Service Vendor
- Define Key Design features (e.g., Access and Risk models)
- Initiate System Design and Development

## ALIGNMENT WITH GLOBAL REGULATORY STANDARDS

- Implement ACSS Interim Credit Risk Model

## RULES MODERNIZATION

- Develop approach to expanded membership



# MODERNIZATION ROADMAP UPDATE

The Industry Roadmap & High-Level Plan published in 2016 has evolved as Payments Canada continues to engage with payments ecosystem members, stakeholders and regulators, and progresses with Modernization activities. Additional planning was conducted in response to further defined requirements, input from members, stakeholders, vendors, and from international and domestic experiences. The changes to the roadmap will de-risk the program by sequencing delivery of systems and extending testing periods.

Payments Modernization is a complex multi-year program with far reaching impacts on the entire Canadian financial services industry. Payments Canada understands that the overall 2017 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.

## Key Updates

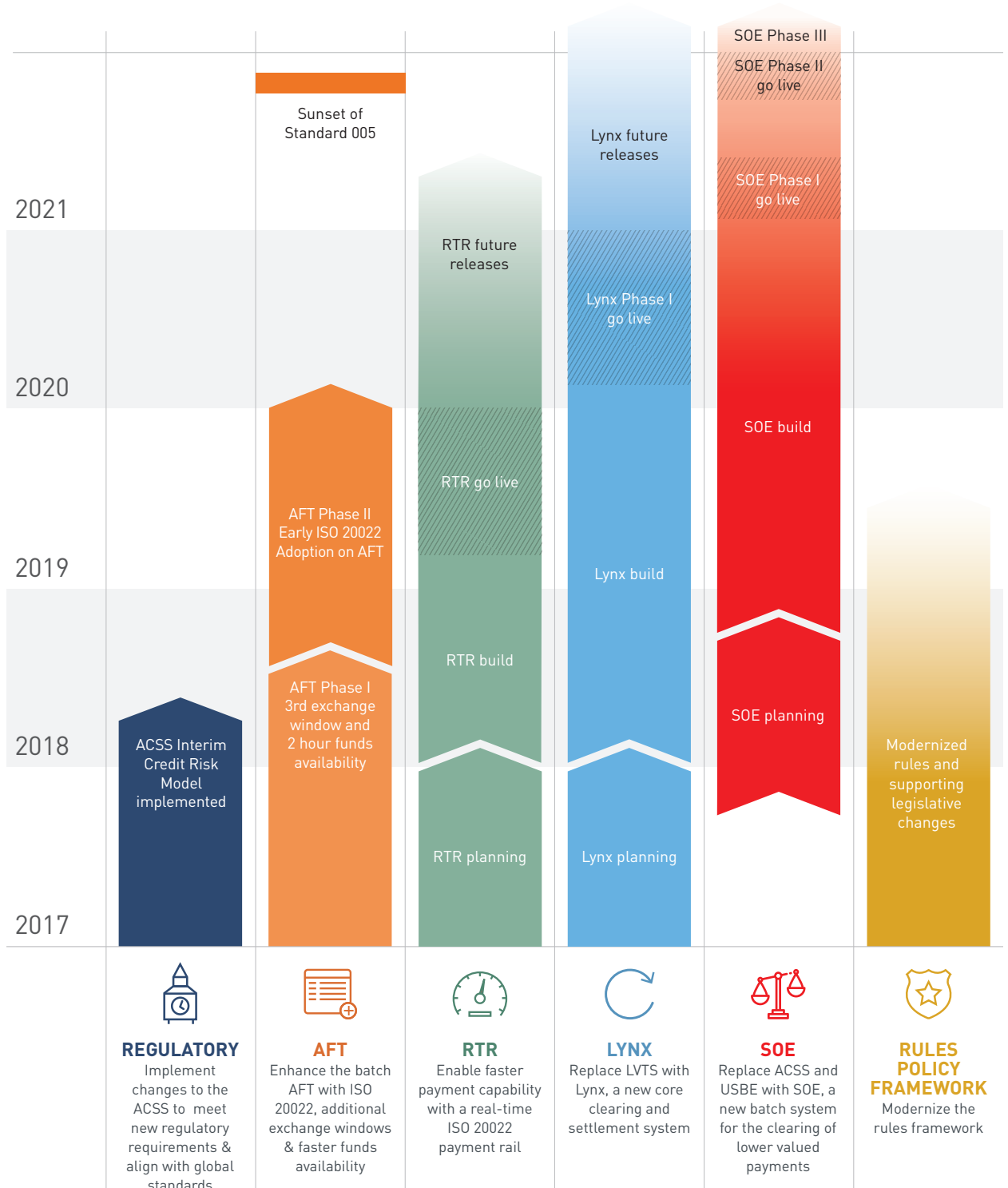
SOE was originally scoped as part of Lynx, and intended to have similar functionalities as ACSS. Upon further consultation and new regulatory requirements, the scope of SOE has been expanded to perform the functions of a full retail batch payment system, including centralized file exchange. As such, Lynx and the SOE have been decoupled for delivery.

AFT Phase II was originally scoped to include the migration to ISO 20022 messages, the addition of a 4th and 5th exchange window, and one-hour funds availability. AFT Phase II has been rescoped to focus exclusively on ISO 20022. The additional exchange windows and 1-hour fund availability will be reassessed once the benefits of Phases I & II have accrued.

The approach for the delivery of real-time payments capability has been split into a series of releases. The first release of the new system will occur in mid-2019, with subsequent releases occurring at six-month intervals. The RTR will 'go live' supporting ISO 20022 as its native messaging standard.



# ROADMAP TIMELINE



# RISK MANAGEMENT

The Modernization program will change the risk profile for both Payments Canada and the larger payments ecosystem.

**The transition to future end state will generate new risks associated with:**

1

Changing the core payments system infrastructure

2

Changing risk and settlement models for the high value system

3

Updating access and participation rules

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 of 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.



# BEYOND MODERNIZATION 1.0

Payments Canada has outlined a series of potential migration scenarios across the three core payments systems following the Modernization Program. Long-term payment flow forecasting is inherently complex, as such Payments Canada expects the following scenarios to evolve as the Program progresses and as changes in payments behavior can be observed.

Payments Canada further recognizes that the introduction of the real-time payments system, 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.

## Potential Payment Migration Scenarios



### Lynx – High-Value Payments System

- Expected that high-value payments on Lynx will closely resemble payments made today in LVTS.
- Value caps in SOE and RTR will be used to divert higher value payments to Lynx, which is better suited to manage risk.
- Low-value payments that currently use LVTS will likely migrate to the new real-time payments system, taking advantage of the speed, irrevocability, and higher transaction limits enabled by the new risk model.



### SOE – Batch Payments

- Expectation that batch will continue to play a critical role in the clearing and settlement of scheduled and predictable payments in Canada, providing a reliable and efficient mechanism for payment execution.
- New features on AFT such as speed, and same-day exchange and settlement, may draw volumes from Lynx. A value cap in the SOE will be placed to ensure that high-value payments remain on Lynx.
- Expectation that cheque usage will decline and migrate toward more efficient, modern offerings on the RTR or AFT.



### RTR – Real-Time Payments

- Expected to serve business, consumer and government use cases where speed is important and payment value is comparatively low (vis-a-vis Lynx).
- New features used by overlay services to enhance the customer experience, beyond speed of payment, are expected to grow real-time payment volumes.



# BEYOND MODERNIZATION 1.0



## Potential Future Work

### Modernization 2.0

1

#### Greater Efficiency

Investigate ways to drive further efficiency in the ecosystem

2

#### New Capabilities

Investigate potential for offering and supporting new capabilities and services systems

3

#### Retire Legacy Payment Methods

Consider retirement of legacy and paper-based payment methods

4

#### Cross-Border Convenience

Investigate ways to facilitate practical and convenient International payments

5

#### Transaction Transparency

Revisit need for payment status notifications across all payment streams



# BENEFITS OF MODERNIZATION

Delivering a modern payments system impacts all Canadians - consumers, businesses, government and more - 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.



## Faster and More Efficient

Transactions can be processed and cleared faster/in real-time; posting to accounts with faster access to funds.



## Richer Data

Adoption of the richer, more structured messaging standard (ISO 20022); data flows alongside payments.



## More Convenient

Payments initialization and receipt made easier through proxy identifiers and aliases; status notifications and confirmations provided.



## Interoperable

ISO standard allows payors to be "rail" agnostic (choosing the right speed/cost according to need); In addition, cross-border commerce becomes increasingly seamless due to common protocols.



## Greater Security, Risk Management & Privacy

Security with adaptability to emerging threats, next-generation privacy and risk management tools for the most secure payments experience possible.

Refer to the Modernization Target State for more about these core benefits, as well as a portfolio of use cases that illustrate potential real-life benefit scenarios.





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