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An Overview of Lynx, Canada's High-Value Payment System

May 2022

Abstract

This document provides an overview of Lynx—Canada’s high-value payment system—and summarizes the system’s design. It explains the development and purpose of Lynx as well as the legal and regulatory framework governing its operation. It also describes the various settlement mechanisms and processes Lynx uses to allow system participants to meet their diverse payment needs while ensuring that risks that arise in the system are managed appropriately.

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1 A brief overview of Lynx

Lynx is Canada's high-value payment system—an electronic wire system that facilitates the irrevocable transfer of payments in Canadian dollars between participating financial institutions (FIs).¹ Owned and operated by Payments Canada, Lynx began operations on August 30, 2021, replacing the Large Value Transfer System (LVTS), which had been in operation since February 1999.

Lynx is a real-time gross settlement (RTGS) system in which settlement occurs immediately after the clearing of each individual payment, resulting in the instant transfer of funds in central bank money from one participant to another. Once settled, a payment is final and irrevocable. Lynx not only provides a means for settling obligations between participants in the system but also helps the Bank of Canada reinforce the policy interest rate by managing the amount of liquidity in the financial system. Given its centrality to the Canadian financial system, Lynx has been designated as a systemically important clearing and settlement system under the *Payment Clearing and Settlement Act*.

The decision to develop Lynx was driven by the need to upgrade the technology and improve the risk model underpinning the high-value payment infrastructure in Canada. The motivation for the development of Lynx and the legal basis that supports this new system are discussed in sections 2 and 3.

Section 4 describes the life cycle of a Lynx payment—from its initiation by the payor to the receipt of funds by the payee. A payment submitted to Lynx is settled if sufficient liquidity is available to the sending participant (and if no conditions or limits are placed on the payment). Participants have three sources of intraday liquidity in Lynx:

- intraday loans obtained by pledging eligible collateral to the Bank of Canada
- deposits held overnight at the Bank of Canada
- payments received from other Lynx participants, including the Bank of Canada

More information on the role of collateral in Lynx can be found in section 5.

Lynx participants can settle payments using four different settlement mechanisms. Each mechanism is configured to settle payments in a way that meets specific business needs.

- Real-time mechanism (RTM): The RTM is used by participants to track their credit limit, manage their intraday loan and excess liquidity, and settle payments related to interbank lending.
- Liquidity saving mechanism (LSM): The LSM is configured to provide liquidity efficiency through liquidity recycling and payment offsetting. If a participant does not have sufficient liquidity to settle a payment immediately, the payment is queued until sufficient liquidity becomes available, either through incoming payments (liquidity recycling) or through transfers of additional funds into the LSM. Liquidity recycling in the LSM is enhanced by the use of a settlement sequence that bypasses a strict first in, first out (FIFO) ordering of queued payments. In addition, the LSM

¹ Appendix A presents a list of all acronyms used in this document. A glossary of key terms can be found in Appendix B.

employs a payment offsetting algorithm—the Gridlock Buster—that runs periodically and attempts to identify queued payments that can be offset simultaneously.

- Urgent payment mechanism (UPM): The UPM is configured to settle payments immediately. Although the UPM does have a queue, it is intended to prevent payments from being discarded due to timing differences between the registering of a payment and the transfer of intraday liquidity. Unlike the LSM, the UPM does not have a payment offsetting algorithm.
- Reserved collateral mechanism (RCM): The RCM allows for the segregation of intraday liquidity received based on certain reserved collateral pledged to the Bank of Canada. Participants can use this reserved liquidity only to make particular payments to the Bank of Canada.

Each settlement mechanism is funded by separate intraday liquidity accounts. Intraday liquidity can be transferred between settlement mechanisms; however, payments must be settled in the settlement mechanism they were submitted to. A fifth mechanism, the conditional release mechanism (CRM), is not a settlement mechanism but is closely related; it holds payments temporarily, releasing them to a settlement mechanism when pre-specified conditions are met. Section 6 describes the funding process in Lynx, and section 7 describes each settlement mechanism and the CRM in further detail.

Lynx operates on all weekdays that are not federal statutory holidays. The Lynx payments processing cycle is divided into Settlement Window 1 (12:30 a.m. to 6:00 p.m.),² Settlement Window 2 (6:00 p.m. to 6:30 p.m.) and the Finalization Window (6:30 p.m. to 7:00 p.m.). Regular payment activity occurs during Settlement Window 1. Settlement Window 2 and the Finalization Window are reserved for interbank lending and repayment of the intraday loans provided by the Bank of Canada, respectively. Section 8 presents additional information on the Lynx payments processing cycle; section 9 further describes end-of-cycle procedures that take place during Settlement Window 2 and the Finalization Window. Finally, section 10 discusses the contingency arrangements that mitigate operational risk and ensure that Lynx participants can continue to settle payments if operations are disrupted at the primary Lynx data centre.

² All times listed in this document are Eastern Time.

2 Development and purpose of Lynx

Payment systems—the technology infrastructure and the set of payment instruments, procedures and rules that enable the transfer of funds from one entity to another—play a fundamental role in facilitating economic activity. High-value payment systems are used for the clearing and settlement of large-value, critical and time-sensitive payments. These payments include those that involve major financial market infrastructures (FMIs), such as securities settlement systems and retail payment systems. High-value payment systems also serve as a conduit for the central bank to implement monetary policy.

This section offers an overview of payment system risk and risk model design considerations. It also references the primer on the LVTs for historical background (Arjani and McVanel 2006).

2.1 Payment system risk and evolution

When high-value payment systems were first introduced, many countries used a deferred net settlement (DNS) system risk model. DNS systems offer liquidity savings by netting payments, thus creating final settlement positions that are much lower than gross payment flows. However, DNS systems could entail a large buildup of credit and settlement risk during the time lapsed until settlement occurs. Further, participants could delay making funds available to the payee until settlement is completed. To maintain confidence and stability in the financial system, central banks preferred a system with better risk-proofing for settling high-value payments.

To address these issues, many jurisdictions implemented RTGS systems. Each payment processed by such systems involves an immediate transfer of funds across participants' accounts held at the central bank. That is, each payment is settled on a gross—or individual—basis in real time, ensuring that immediate intraday finality is achieved. Under this arrangement, exposure to credit risk between participants is eliminated and systemic risk is mitigated. However, an RTGS system is more liquidity-intensive than a DNS system, since participants must maintain sufficient funds throughout the day to settle payments on an individual basis.

The higher liquidity cost of RTGS systems could lead to outcomes where participants seek to economize on collateral by submitting payments later in the operating cycle. The attempt to limit incentives to delay payments in RTGS systems has led some system operators to explore various liquidity saving mechanisms, such as different types of queue management and liquidity saving features. Queue management techniques include assigning priority categories for payments and reordering payments once in the queue; liquidity saving features typically involve offsetting payments in the queue, a feature commonly referred to as gridlock resolution (see Bech and Soramäki 2001).

Another approach to balancing risks, payment delays and liquidity has been the development of hybrid systems (see McAndrews and Trundle 2001; Leinonen and Soramäki 1999). Hybrid systems apply advanced settlement algorithms that combine components of both DNS and RTGS. Some payments may be settled individually, as in RTGS, while others—usually those that are less urgent—may be pooled together and netted with immediate finality. Other features may include bilateral limits to manage credit exposures and reciprocity. Hybrid systems typically use separate streams for urgent and non-urgent payments or employ forms of bilateral and multilateral

offsetting algorithms on a continuous basis. In Canada, the LVTS—launched in February 1999—used a hybrid approach. This allowed for immediate finality of individual payments while offering participants a variety of collateral efficiency features as a result of the system being settled on a deferred multilateral net basis.

2.2 Motivation and purpose for Lynx

In 2015, Payments Canada embarked on a multi-year initiative to modernize the payment systems infrastructure in Canada with the help of its members, partner organizations and the Bank of Canada. Through consultations with the various stakeholders about the requirements of next-generation payment systems, it became clear that LVTS warranted enhancements along two dimensions. The first was to deliver a new technological solution underpinning the application built on modern software and hardware capabilities. The second was to enhance and strengthen the settlement risk model and align it with the preference for RTGS systems expressed in the *Principles for Financial Market Infrastructures* (PFMI) set out by the Committee on Payments and Market Infrastructures (CPMI) of the Bank for International Settlements (BIS) and the International Organization of Securities Commissions (IOSCO). The collateral efficiency achieved by the settlement model of LVTS relied on a unique shared survivor-pay collateral pool arrangement that fully covered settlement (credit) risk in the event of one default.³ In the event of multiple defaults, if the survivor-pay collateral pool was not sufficient to fully cover the amount at risk, the system relied on a residual guarantee from the Bank of Canada to fund any additional shortfall. The result of this endeavour culminated in the build and launch of Lynx, which combines the properties of an RTGS model with liquidity saving mechanisms to foster liquidity efficiency while minimizing payment delay. In addition, Lynx's risk model eliminates the need for the Bank of Canada's residual guarantee.⁴

Due to the nature of RTGS systems, Lynx does not create credit risk exposures between participants. As a result, the primary risk participants face in Lynx is intraday liquidity risk. As summarized in **Table 1**, intraday liquidity is monitored and managed using a variety of tools, including certain provisions in the legal framework, functionalities that are automated in the design and configuration of Lynx, and tools that can be used at participants' discretion. These tools are discussed throughout the document.⁵

³ In the LVTS, payments were processed with finality on a gross basis in real time, even though settlement of the system occurred on a multilateral net basis at the end of the payments cycle. As a result, beneficiaries of payments in the LVTS were able to use these funds immediately upon receipt, knowing that they would not be revoked or unwound in the future. The Bank of Canada's residual guarantee was key to ensuring that LVTS payments settled under all circumstances. Credit risk in the LVTS was managed by a combination of collateral arrangements, bilateral credit limits and multilateral credit limits (see Arjani and McVanel 2006 for details).

⁴ Appendix C summarizes the main differences between Lynx and LVTS.

⁵ See Appendix D for an overview of risk management in Lynx.

Table 1: Intraday liquidity management tools in Lynx

Tool	Legal framework	Automated in Lynx	Discretionary
Throughput targets	✓		
Minimum liquidity requirements	✓	✓	
Queueing		✓	
FIFO bypass		✓	
Gridlock Buster		✓	
Queue management tools			✓
Intraday liquidity buffer			✓
Payment settlement priorities			✓
Net send limits			✓
Real-time monitoring			✓

Note: FIFO is first in, first out.

2.3 Description of payment activity in Lynx

Payments in Lynx consist of both interbank and client-driven Canadian-dollar wire transfers, including transactions between Lynx participants and the Bank of Canada.⁶ On a typical day in 2021, Lynx processed about 49,000 transactions worth over \$210 billion.^{7, 8} In addition to the standard exchange of funds between Lynx participants and their clients to meet various payment obligations, Lynx also supports the broader functioning of the Canadian financial system through:

- settlement of the Canadian-dollar leg of cross-border, foreign exchange transactions undertaken using the CLS Bank's settlement services
- settlement of CDSX obligations (CDSX is the clearing and settlement system for securities denominated in Canadian dollars)
- transfer of funds for the purpose of settlement of participants' multilateral net positions in the Automated Clearing Settlement System (ACSS), Payments Canada's clearing and settlement system for retail payments
- Government of Canada transactions (federal receipts and disbursements)
- the Bank of Canada's own payments and those of its clients other than the Government of Canada, including foreign central banks and certain international organizations

⁶ Lynx processes not only large-value payments but also a significant number of small-value, time-sensitive payments.

⁷ Throughout this document, all dollar amounts are in Canadian dollars.

⁸ Note that these statistics exclude the transfer of settlement balances between the Bank of Canada and Lynx participants. It is important to note, furthermore, that not all Canadian-dollar wire payments are processed by Lynx. Payments between customers of the same financial institution—known as on-us payments—are not transferred using Lynx; instead, they are settled directly by the FI.

3 Legal and regulatory framework

This section provides a brief overview of the legal framework that governs Lynx. It also describes the criteria for eligible institutions to become direct participants in the system.

3.1 Ownership

Lynx is owned and operated by Payments Canada, a not-for-profit, public-purpose organization created by an Act of Parliament in 1980. In 2021, Payments Canada had more than 100 members, including the Bank of Canada, chartered banks, credit union centrals, trust and loan companies and other FIs. As per the *Canadian Payments Act*, Payments Canada's mandate is to:

- establish and operate national systems for the clearing and settlement of payments and other arrangements for the making or exchange of payments
- facilitate the interaction of its clearing and settlement systems and related arrangements with other systems or arrangements involved in the exchange, clearing or settlement of payments
- facilitate the development of new payment methods and technologies⁹

In fulfilling its mandate, Payments Canada has the public policy objective of promoting the efficiency, safety and soundness of its clearing and settlement systems and considering the interests of users.

3.2 Oversight

The Minister of Finance has oversight powers with respect to Payments Canada and payment systems under the *Canadian Payments Act*. These include general directive powers as well as responsibilities and powers related to by-laws, rules and standards made by the Payments Canada Board of Directors, along with other powers regarding non-Payments Canada payment systems designated under Part 2 of the *Canadian Payments Act*.

The Bank of Canada has designated Lynx as a systemically important payment system under the *Payment Clearing and Settlement Act*. As such, Lynx must observe the Bank of Canada's [Risk Management Standards for Designated FMIs](#), which are based on the CPMI-IOSCO PFMI.

3.3 Legal basis

Lynx's legal basis consists of a combination of by-laws and rules. By-laws specify rights and responsibilities of the different parties in the system and are operationalized by specific rules. Payments Canada works with stakeholders and advisory groups to promote the safety and efficiency of Lynx through the development and implementation of rules and procedures governing the exchange of payment items. Payments Canada is responsible for ensuring participant compliance with these rules and procedures.

⁹ *Canadian Payments Act*, RSC 1985, c. C-21, s. 5.

3.4 Access model

Only direct participants can send and receive Lynx payments on their own behalf and on behalf of others. Institutions that are not Lynx participants can indirectly send and receive Lynx payments through a Lynx participant. To become a Lynx participant, an institution must meet certain eligibility requirements established by Payments Canada, including:

- Payments Canada membership
- a settlement account at the Bank of Canada
- ability to transmit SWIFT (Society for Worldwide Interbank Financial Telecommunication) messages
- personnel, technical and reporting requirements to ensure ability to participate in Lynx

At the time of publication of this document, Lynx had 17 participants, listed here in alphabetical order:

- | | |
|---|---|
| ▪ ATB Financial | ▪ Fédération des caisses Desjardins du Québec |
| ▪ Bank of America, National Association | ▪ HSBC Bank Canada |
| ▪ Bank of Canada | ▪ ICICI Bank of Canada |
| ▪ Bank of Montreal | ▪ Laurentian Bank of Canada |
| ▪ Bank of Nova Scotia | ▪ National Bank of Canada |
| ▪ BNP Paribas | ▪ Royal Bank of Canada |
| ▪ Canadian Imperial Bank of Commerce | ▪ State Street |
| ▪ Central 1 Credit Union | ▪ Toronto-Dominion Bank |
| ▪ Citibank N.A. ¹⁰ | |

¹⁰ With the exception of Citibank N.A., which joined Lynx in September 2021, all Lynx participants were previously LVTS participants.

4 Life cycle of a Lynx payment

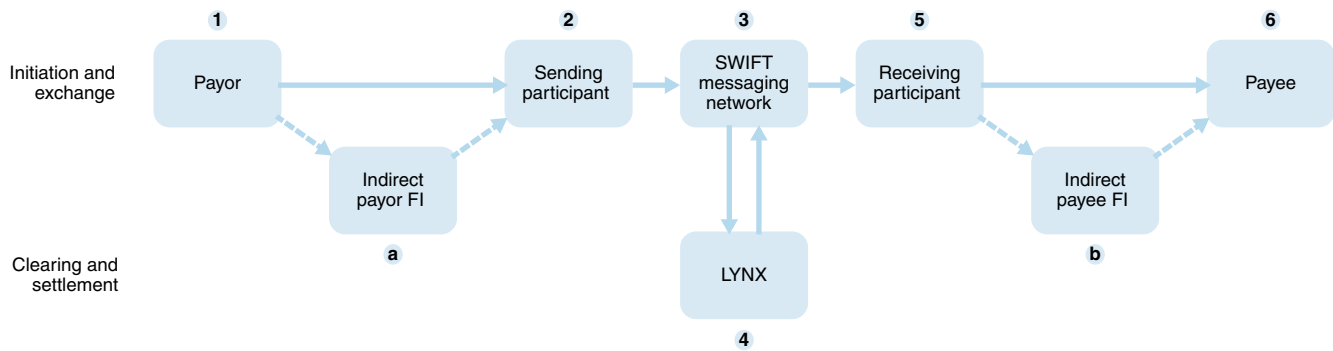
This section provides an overview of the life cycle of a Lynx payment, from the initiation of a wire transfer by a payor—whether an individual client, business or an FI—to the receipt of funds by the payee (beneficiary).

Figure 1 provides an overview of the process that can be broadly divided into two phases:

- Initiation and exchange: payment items are exchanged using the SWIFT network.
- Clearing and settlement: obligations arising from those items are reconciled (clearing) and discharged (settlement).

Each of these phases is described in more detail below.

Figure 1: The life cycle of a Lynx payment—client transfer



- (1) The client (payor) requests a wire transfer to be made by its FI.
- (2) The FI conducts internal checks, including whether the client's account has sufficient funds (or credit) and, if funds are available, immediately debits the full payment amount from the account. In the event the client's FI is not a Lynx participant, then the client's FI must send its client's payment via a Lynx participant (a). The sending participant then releases the payment message to the SWIFT messaging network.
- (3) SWIFT receives the payment message from the sending participant. It holds the original message and makes a copy of certain fields, which it passes to Lynx. The fields from the payment message that are relayed to Lynx include sending participant, receiving participant, message type, settlement mechanism, amount, value date, and currency.

- (4) Lynx receives the partial copy of the payment message, which is registered in the system and assigned a unique identifier. A Lynx payment settles only when sufficient liquidity is available; otherwise, the payment is usually queued until sufficient funds are made available. Once a payment settles, it is final and irrevocable. Lynx immediately assigns the settled payment a payment confirmation reference number (PCRNR) and notifies sending and receiving FIs.
- (5) After the payment settles, funds are made available to the receiving participant in real time.
- (6) The receiving participant credits the payment amount to the payee's account, either directly (if the payee banks with the receiving participant) or indirectly (if the payee is a client of an FI that is not a Lynx participant) (b).

Note: SWIFT is the Society for Worldwide Interbank Financial Telecommunication, and FI means financial institution.

4.1 Initiation and exchange

Lynx payments can be initiated in a number of ways, depending on the services offered by individual FIs. For example, a consumer may visit their local branch to request a wire transfer, or businesses and corporate clients might submit payments through an FI's web portal. In addition to transfers on behalf of clients, Lynx participants also exchange wire transfers on their own behalf and on behalf of other FIs that are not Lynx participants.

Once a wire payment is initiated by a client, the client's FI first confirms that the client has sufficient funds (or credit). After passing any other internal checks conducted by the FI, if funds are available, the client's account is debited the full payment amount. Next, if the client's FI is a Lynx participant, the FI releases a payment message containing settlement instructions to

the SWIFT messaging network (see **Box 1**).¹¹ If the client's FI is not a Lynx participant, that FI must first send the settlement instructions to a Lynx participant, who then verifies whether the client's FI has sufficient funds before releasing the payment message to the SWIFT network.

Throughout this document, the Lynx participant that sends the payment message to the SWIFT network is referred to as the *sending participant*, while the Lynx participant that receives the payment message is called the *receiving participant*.¹²

Box 1:

The Society for Worldwide Interbank Financial Telecommunication

Founded in 1973 and headquartered in Belgium, the Society for Worldwide Interbank Financial Telecommunication (SWIFT) is a global cooperative that owns and operates the messaging network over which Lynx participants exchange payment instructions. More than 11,000 institutions in over 200 countries use the services offered by SWIFT.

The SWIFT network provides a secure, standardized and reliable environment in which financial institutions can exchange payment messages. The use of standardized message formats—which are also managed and maintained by SWIFT—ensures that financial institutions have a common understanding of the data and facilitates the processing of payment messages exchanged between users.

All payment messages sent through the SWIFT network are scanned for anti-money laundering and anti-terrorist financing purposes in accordance with Canadian and applicable international laws.

SWIFT receives the payment message from the sending participant. If the information in the payment message meets the criteria established by Payments Canada for Lynx payments, SWIFT stores the original message and makes a copy of certain fields—often referred to as a *partial copy*—which it passes to Lynx. The fields from the payment message that are relayed to Lynx include:

- sending participant
- receiving participant
- message type
- settlement mechanism
- amount
- value date
- currency

¹¹ Canada and other countries around the world are moving to ISO 20022, a new financial message standard that allows larger amounts of data to be transmitted in a payment. This new standard is expected to bring a number of benefits to Canadian consumers and businesses, including smoother cross-border exchanges, faster adaptability to changing technology, and less reliance on manual processes and older technologies. As part of the adoption of ISO 20022, the migration of Lynx payments from SWIFT's traditional Message Types (MT) to the new MX message scheme is scheduled to start in late 2022. MX messages are XML-based messages that can store more information than the legacy MT messages.

¹² The description in this section focuses on client transfers. Transfers between FIs follow a similar process, with a couple of important differences: (i) in the case of an FI transfer, both the payor and the payee are FIs that either are Lynx participants or use the services of a Lynx participant; and (ii) client transfers and FI transfers use different SWIFT message types.

This is the minimum information required for Lynx to perform its risk control evaluation of a payment. No sensitive client information—such as client account numbers or remittance information—is provided to Payments Canada. This ensures that client information remains confidential to the sending and receiving participants.

4.2 Clearing and settlement

When a payment first enters Lynx, it is registered in the system and assigned a unique identifier. After registration, the payment can change status multiple times during the Lynx payments processing cycle. It is important to note, however, that a payment can have only one status at a time. The main payment statuses are described in **Table 2**.

Table 2: Key payment statuses in Lynx

Status	Description
Registered	A payment is received by Lynx and assigned a unique identifier. The registration process constitutes acknowledgement of the payment within Lynx.
Diarized	A payment is put on hold until a specific condition is met. Once the condition is met, the payment is released for settlement.
Queued	When the sending participant does not have sufficient liquidity to settle a payment, the payment may be queued until enough liquidity is available. If the payment stays in the queue beyond the scheduled end time, it is discarded.
Settled	The amount indicated in a payment is transferred from the sending participant's account in a given settlement mechanism to the receiving participant's account in the same settlement mechanism.
Discarded	A payment that cannot be processed by a scheduled time is automatically discarded by the system.
Removed	An unsettled payment is cancelled by the sending participant.

A few examples can help illustrate how the status of a Lynx payment can change throughout a Lynx payments processing cycle.

- Example 1: After Payment A is *registered* in Lynx, it is *queued* because the sending participant did not have sufficient liquidity to settle the payment immediately. Once enough funds are available, the payment is *settled*.
- Example 2: After being *registered*, Payment B is *queued*. The sending participant then specifies that the payment should not settle before 2:00 p.m. This causes the payment to be *diarized*—i.e., held—until the specified time, at which point it is released for settlement. When that happens, the payment could be *queued* again (due to insufficient liquidity) or *settled* immediately (if sufficient liquidity is available).
- Example 3: After being *registered* in Lynx, Payment C is *queued* until the sending participant has sufficient liquidity. However, if the Lynx participant does not manage to secure enough liquidity to fund the payment during the Lynx payments processing cycle, the payment is *discarded*.

In Lynx, a payment clears and settles only when the sending participant has sufficient funds; otherwise, the payment is generally queued until sufficient funds are made available. When settlement occurs, funds are made available to the receiving participant in real time and the payment is deemed final and irrevocable. Lynx also immediately assigns a payment confirmation reference number (PCRN) to the settled payment, which provides the sending and receiving participants with confirmation that settlement has occurred. The receiving participant then has until the end of the payments processing cycle to credit the payee's account; however, credit is typically provided to the payee in near-real time. (The mechanisms and processes used by Lynx to settle payments are explained in section 7.)

5 The role of collateral

Participants generate the liquidity required to settle Lynx payments from one of three sources:

- by receiving payments from other Lynx participants
- by borrowing from the Bank of Canada through an intraday loan
- from any overnight deposits they make with the Bank of Canada

Collateral is instrumental in the provision of an intraday loan to a participant. This section discusses the role of collateral in Lynx, including the purpose of collateral, how it is pledged, the allocation process and how the Bank of Canada manages the market risks associated with pledged collateral.

5.1 Purpose of collateral

Lynx participants use collateral for two purposes. First, they must allocate collateral value to Lynx to secure an intraday loan, which provides them with intraday liquidity to settle Lynx payments. Second, if a participant does not have enough liquidity in its account to repay its intraday loan, collateral is used to secure an overnight advance from the Bank of Canada. This overnight advance is used to repay the participant's intraday loan position, which must be repaid before the end of the following Lynx payments processing cycle. (This is discussed in further detail in section 9.)

Participants typically pledge collateral to the Bank of Canada using an electronic book-entry process within CDSX, which is operated by the Canadian Depository for Securities (CDS). Upon receipt of the pledged collateral, the Bank determines its value, including any adjustments for margin requirements. To ensure that a participant's collateral valuation does not fall below its intraday loan position, the Bank of Canada revalues pledged collateral allocated to Lynx every day but only just before the start of the Lynx payments processing cycle.

5.2 Lynx allocation

The value of collateral that has been pledged is available for participants to allocate for any of several purposes, including Lynx. Each participant must allocate collateral value to Lynx using the Bank of Canada's High-Availability Banking System (HABS) no later than 11:45 p.m. every day, before the Lynx payments processing cycle begins. This allocation establishes the participant's credit limit, which sets the ceiling for the amount the participant can borrow from the Bank of Canada (i.e., the maximum allowable intraday loan for the participant) for the upcoming Lynx payments processing cycle. (The use of a participant's credit and the creation of an intraday loan are described in section 6.)

Any collateral not allocated to Lynx or used for any other purpose (e.g., ACSS) remains as excess collateral (i.e., unallocated value of the collateral pool). Participants can increase their Lynx allocation in HABS at any time during a Lynx payments processing cycle by using this excess collateral value. Conversely, participants may reduce their Lynx allocation during a Lynx payments processing cycle as long as the reduction does not result in the participant's intraday loan exceeding the participant's credit limit at that point in time. This ensures that all intraday loans remain fully collateralized throughout the Lynx payments processing cycle.

5.3 Managing market risks associated with collateral

If a Lynx participant cannot repay its overnight advance when due before the end of the following Lynx payments processing cycle, the participant will be in default of its loan agreement with the Bank of Canada and could be suspended from participating in Lynx. Under such a scenario, the Bank of Canada would take possession of the participant's collateral and could then liquidate that collateral to cover its exposure arising from the participant's default. However, given that collateral value is subject to fluctuations, the Bank of Canada faces market risk because the value of the collateral could decrease from the time the participant allocated it to Lynx until the time the Bank of Canada liquidates it. This could lead to a financial loss for the Bank of Canada.

The Bank protects itself from the market risk exposure of collateral in two ways. First, it sets eligibility criteria for the types of assets that Lynx participants can pledge. These criteria include issuer, currency type and concentration limits. Second, the Bank sets margin requirements (i.e., "haircuts") for the pledged collateral to account for any potential fluctuations in value.

The Bank periodically updates the list of assets eligible as collateral and the corresponding margin requirements based on internal analysis. Further information on collateral policies as well as the eligible securities and associated margin requirements is available on the [Bank of Canada's website](#).

6 Funding process

This section details how participants fund the different settlement mechanisms in Lynx. The Bank of Canada's HABS first communicates each participant's credit limit to Lynx. As the participant draws upon this credit, the amount of credit available decreases and the participant's intraday loan increases.

6.1 Lynx account structure

One key feature of Lynx is its flexibility. Lynx participants can settle payments using four different settlement mechanisms:

- real-time mechanism
- urgent payment mechanism
- liquidity saving mechanism
- reserved collateral mechanism

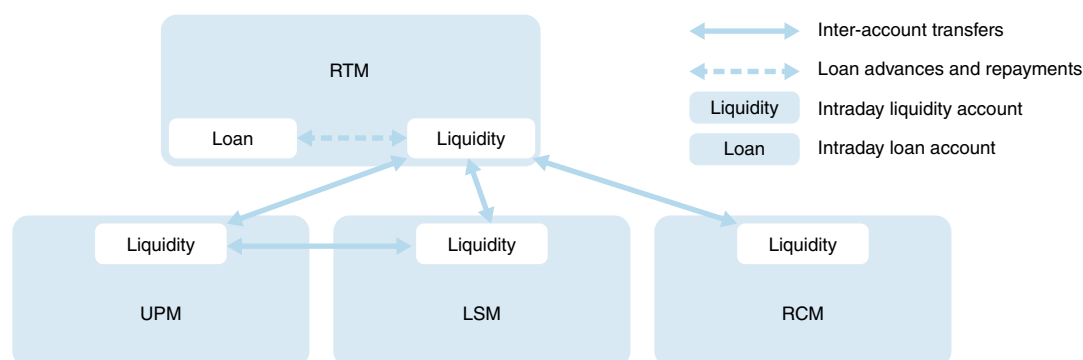
Each settlement mechanism is configured to settle payments in a way that meets specific business needs. One distinction between settlement mechanisms relates to liquidity efficiency. The LSM is configured to reduce a participant's liquidity needs through liquidity recycling and payment offsetting. In contrast, the UPM is not designed to provide liquidity savings. Rather, it is configured so that participants can more easily manage the settlement order of payments.

Another distinction is that certain settlement mechanisms are designed to settle only a well-defined set of payments. The RTM, for instance, processes only those transactions related to overnight interbank lending, which participants enter during Settlement Window 2. The RCM, in turn, can be used only to settle CDSX settlement obligations (although these payments can also be sent through the UPM or the LSM). Ultimately, for each payment submitted, Lynx participants decide which settlement mechanism best meets their needs and those of their clients. (The settlement mechanisms are described in greater detail in section 7.)

Every participant has an intraday liquidity account in each of the four settlement mechanisms. Participants can transfer liquidity between settlement mechanisms except from out of the RCM, but payments must remain in the settlement mechanism to which they were sent. When a payment settles, the sending participant's intraday account in the settlement mechanism is debited and the receiving participant's intraday account in the same settlement mechanism is credited. All participants must be active in all four settlement mechanisms—regardless of whether they plan to use all mechanisms—in order to facilitate the receipt of payments. In addition to these intraday liquidity accounts, each participant has an intraday loan account to track advances and repayments of the intraday loans provided by the Bank of Canada. **Figure 2** depicts the settlement mechanisms, the accounts in each and the allowable liquidity transfer paths.

A participant's intraday liquidity accounts are used to record the settlement of Lynx payment obligations to and from other participants, as well as transfers of intraday liquidity:

- to the RTM intraday liquidity account resulting from advances recorded on the intraday loan account
- from the RTM intraday liquidity account to the intraday loan account to repay intraday loans
- between settlement mechanisms

Figure 2: Liquidity transfers between Lynx accounts

Note: RTM is real-time mechanism, UPM is urgent payment mechanism, LSM is liquidity saving mechanism, and RCM is reserved collateral mechanism.

The intraday liquidity accounts do not allow for overdrafts and must always have a zero or positive balance.

Two exceptions to the Lynx account structure discussed above involve the Bank of Canada. First, the Bank does not have an intraday loan account. And second, the Bank's RTM account does allow for overdraft, which is the Bank's means for funding its activity in Lynx.

Both the intraday loan accounts and the intraday liquidity accounts are provided to participants by the Bank of Canada and managed by participants through Lynx. In effect, Lynx serves as the book of record during the payments processing cycle for these accounts.

6.2 Intraday loans and the funding of settlement mechanisms

Participants fund their intraday liquidity accounts in a settlement mechanism by borrowing from the Bank of Canada and transferring the proceeds to an intraday liquidity account. Given that the intraday loans must be repaid by the end of the Lynx payments processing cycle, interest is not accrued.

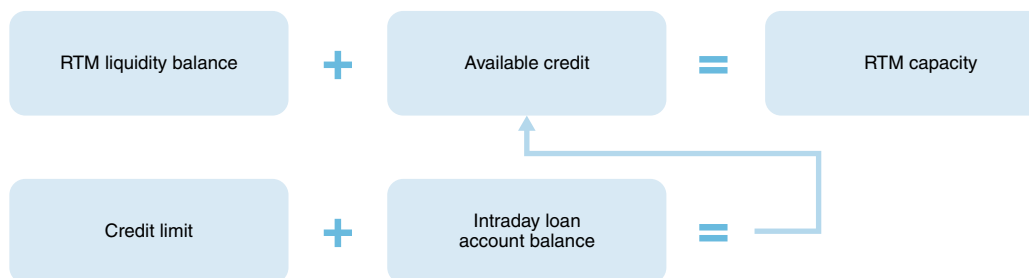
Both the amount of funding and the settlement mechanism(s) it is transferred to are at the discretion of the participants, with the exception of the LSM, which does have a minimum funding requirement at the start of each day (see section 7.1.3). Participants are not required to fund their UPM or RCM intraday liquidity accounts. Participants make their funding decisions based on their (expected) use of settlement mechanisms. These decisions are based on each settlement mechanism's configuration, the anticipated payment value (sent and received), the participant's tolerance for queueing, risks, and other considerations. Funding instructions can be automated in Lynx through recurring or future-dated instructions to transfer intraday liquidity at a specific time of day or at a certain point in the daily operating schedule.

6.3 Real-time mechanism capacity

This section discusses RTM capacity in Lynx and how it could affect a participant's intraday loan account balance. For certain transactions, Lynx treats the intraday liquidity in the RTM and the available credit in the RTM as fungible.

As shown in **Figure 3**, the RTM capacity available to each participant is equal to the total of a participant's available credit (defined as the difference between the credit limit and the intraday loan balance) and its RTM liquidity balance. For certain transactions (see details below), if a shortfall of intraday liquidity exists, Lynx will automatically use RTM capacity to fund the transactions. The benefit of this is that instructions will not be discarded due to insufficient liquidity in cases where the total of the two, i.e., RTM capacity, is sufficient to process the transaction.

Figure 3: Components of real-time mechanism capacity



Note: RTM is real-time mechanism.

The following types of transactions take RTM capacity into account. Automated entries are made to the intraday loan account before the transaction is completed, when necessary.

- **Intra-account transfers:** These are transfers from the RTM to another settlement mechanism where the user has selected the “utilize credit” transfer option and an intraday loan advance is required to successfully complete the transfer.
- **RTM payments:** These payments are made during Settlement Window 2 in the RTM when insufficient liquidity is available and there is enough available credit to supplement the liquidity balance and settle the payment.
- **Final Gridlock Buster:** If payments remain queued when the final Gridlock Buster is performed and liquidity is insufficient in the participant's LSM account to settle its payments, the Gridlock Buster will automatically transfer RTM capacity from the RTM to the LSM.
- **Intraday credit limit reduction:** If a participant requests a decrease to its Lynx allocation/credit limit intraday and the new credit limit is less than the current intraday loan balance, Lynx will automatically repay a portion of the intraday loan using liquidity from the RTM account when there is sufficient liquidity to do so.

It is important to note that the first three transactions above result in an automated advance from the intraday loan account, while the final one involves an automated repayment of the intraday loan.

7 Settlement

The differences between settlement mechanisms can be divided broadly into two categories:

- Liquidity management configurations—these include tools, such as payment priority levels and net send limits, that are available to participants to help manage their payments and minimum liquidity requirements set by Payments Canada.
- Settlement processes—Lynx settles payments using three distinct settlement processes. In addition to immediate settlement when funds are available, Lynx uses a liquidity recycling process and a payments offsetting algorithm to settle queued payments.

To help contextualize these differences, this section first provides an overview of the liquidity management configurations and settlement processes available in Lynx. Next, each settlement mechanism is described in detail. The CRM, which is not a settlement mechanism but is closely associated with them, is also discussed. Finally, this section explains how throughput targets are used to help coordinate payment activity and reduce participants' intraday liquidity requirements.

7.1 Liquidity management configurations

The following liquidity management configurations play a key role in how each settlement mechanism works.

7.1.1 *Payment priority levels*

Payment priority levels allow participants to rank their payments according to settlement importance, which affects how each participant's queued payments are ordered. A participant's lower-priority payments cannot be settled until all of its higher-priority queued payments have been settled. The priority levels used by one participant affect only the settlement sequence of that participant's payments and do not directly impact that of other participants.

If a priority level is not assigned to a payment, Lynx automatically assigns the default priority level of 99 to that payment, which is the lowest available priority. When multiple priority levels are available, participants can reprioritize payments as needed (e.g., if a low-priority payment becomes urgent, a participant can change the payment priority).

The number of priority levels available to participants depends on the settlement mechanism used. While the UPM and RCM have only one priority level (99), the LSM has four (from highest to lowest: 1, 3, 5 and 99). The RTM does not allow payments to be queued (i.e., if insufficient liquidity exists, the payment is immediately discarded) and therefore does not have any priority levels.

7.1.2 *Net send limits*

Net send limits (NSLs) enable participants to set limits to their bilateral net debit position with respect to other participants. For example, if participant A sets an NSL of \$5 million for its interactions with participant B, then payments from participant A to participant B will be temporarily placed in the CRM (see section 7.4 for additional details) whenever the value of a payment sent by participant A to participant B would result in a bilateral net debit position greater than \$5 million. In other words, an NSL effectively limits the value of

payments that a participant is willing to send to another participant without receiving payments in return. If an NSL results in a payment being held in the CRM, the payment is released at a later time when it can be settled and not result in a bilateral net debit position that exceeds the NSL.

The use of NSLs provides the following benefits:

- Participants are able to manage liquidity by avoiding one-sided outflows.
- Payments are more synchronized.
- Payment behaviour is influenced by encouraging participants to submit payments as early as possible.

NSLs are enabled only in the LSM.

7.1.3 Minimum liquidity requirements

A minimum liquidity requirement (MLR) is the minimum amount of intraday liquidity that each participant must transfer from its intraday loan account to a settlement mechanism at the beginning of a Lynx payments processing cycle in order to send and receive payments in that settlement mechanism. Note that the participant is not required to maintain that level of liquidity in the settlement mechanism throughout the entire Lynx payments processing cycle—the participant's liquidity may dip below the MLR during the day.

An MLR serves the following purposes:

- It ensures all participants contribute liquidity to the system so that settlement can begin.
- It provides a means for participants to show other participants that they are ready to participate in the settlement mechanism.
- It encourages participants to use a specific settlement mechanism.

The LSM is the only settlement mechanism with an MLR, which is set to 1% of the average daily value sent by each participant (excluding the Bank of Canada) over the past 12 months (updated quarterly).

7.2 Settlement processes

Lynx settles payments using the following processes:

- *Immediate settlement* occurs whenever a participant has sufficient liquidity to settle a newly submitted payment and no other payments with the same or a higher priority level are in the queue.
- *Impact intervention* is a liquidity recycling process that attempts to settle the queued payments of all participants sequentially, i.e., funds that a participant receives from incoming payments are used to settle the participant's own queued payments, and those funds are used next to settle the receiving participant's payments, and so on. Every dollar received by a participant thus reduces that participant's intraday liquidity needs and increases system-wide liquidity efficiency.
- *Gridlock Buster* is a multi-stage algorithm that attempts to simultaneously offset two or more queued payments on a multilateral or bilateral basis. The Gridlock Buster reduces the amount of time payments spend in the queue and further increases the liquidity efficiency of the system.

If a payment cannot be settled immediately, it is either queued or discarded, depending on the settlement mechanism used. A payment sent to any settlement mechanism other than the RTM is queued until sufficient intraday liquidity becomes available or until the end of Settlement Window 1 is

reached, at which point unsettled payments are discarded. A payment sent to the RTM during Settlement Window 2 is immediately discarded if the sending participant does not have enough RTM capacity, because the RTM does not have a queue.

Each of Lynx's three settlement processes is described in more detail below.

7.2.1 Immediate settlement

Immediate settlement occurs when a payment is received in a settlement mechanism and the following conditions are met:

- The sending participant has sufficient liquidity in the settlement mechanism to settle the payment.
- The sending participant does not have any queued payments in the settlement mechanism OR the new payment has a higher priority than all of the sending participant's queued payments.

This settlement process is used to settle payments in all four of Lynx's settlement mechanisms.

7.2.2 Impact intervention

An impact intervention occurs when there is a change either in queued payments or in the liquidity available to participants in a given settlement mechanism. Changes that trigger an impact intervention include a new payment entering the settlement mechanism, existing queued payments being reprioritized, a participant transferring additional liquidity to the settlement mechanism, and a Gridlock Buster run.

During an impact intervention, Lynx creates a list of queued payments for each sending participant, sorting these lists according to:

- priority level
- internal sequence number (applicable when payments with the same priority level are manually re-sequenced by a participant)
- queued time

The system then goes through each list, evaluating each payment sequentially and settling it when a participant has sufficient liquidity. As noted earlier, a payment with a lower priority level from a given sending participant cannot be settled until all payments with higher priority levels from that participant have been settled.

Lynx has two options for determining the sequence in which the impact intervention process settles payments: FIFO and FIFO bypass. The FIFO settlement sequence ensures that, for each priority level, payments are settled in the same order in which they are received by the settlement mechanism (unless they have been manually re-sequenced). A participant's liquidity is first used to settle the first payment in the queue; if enough liquidity remains, the second payment in the queue is then settled, and the process continues until no more payments can be settled. In a FIFO sequence, a large-value payment can potentially block all other payments from being settled until a participant obtains enough liquidity to settle the payment.

When the settlement sequence is set to FIFO bypass, the impact intervention process still attempts to settle payments based on the order they are received, but it now allows for queued payments to be skipped due to insufficient liquidity so that subsequent queued payments with smaller values can be settled. Therefore, unlike in the FIFO settlement sequence, a single

large-value payment does not block other payments with the same priority level from being settled. It is important to note, however, that priority levels are still respected in a FIFO bypass, meaning that all higher-priority payments must be settled before lower-priority payments can settle.

Figure 4 illustrates the differences between FIFO and FIFO bypass with three scenarios. In all three, the participant has the same queued payments and the same starting liquidity (\$750,000).

- In scenario A, the settlement sequence is set to FIFO. Only the first payment in the queue (\$250,000) is settled and the process stops once the second payment (\$1,000,000) is evaluated because the participant has insufficient liquidity (\$500,000) to settle that payment.
- In scenario B, the settlement sequence is set to FIFO bypass. In this scenario, the process settles three payments—the first in the queue, the third and the fifth—bypassing payments with the same priority level but for which the participant did not have enough liquidity.
- Finally, scenario C also uses FIFO bypass, but in this case only the first payment settles because the participant does not have sufficient liquidity to settle the second payment, which has priority 1 and therefore must be settled before the other payments, all of which have priority 99.

This settlement process is used to settle payments in the UPM, LSM and RCM but not the RTM, which does not allow payments to be queued. The UPM and the RCM are configured with the FIFO settlement sequence, while the LSM uses FIFO bypass.

Figure 4: Impact intervention scenarios—FIFO and FIFO bypass

(A) FIFO settlement sequence; single priority payments

Queued payment sequence	Priority	Amount	
1	99	\$250,000	← Settle
2	99	\$1,000,000	
3	99	\$300,000	
4	99	\$2,000,000	
5	99	\$100,000	

Participant's liquidity in settlement mechanism = \$750,000

(B) FIFO bypass settlement sequence; single priority payments

Queued payment sequence	Priority	Amount	
1	99	\$250,000	← Settle
2	99	\$1,000,000	
3	99	\$300,000	← Settle
4	99	\$2,000,000	
5	99	\$100,000	← Settle

Participant's liquidity in settlement mechanism = \$750,000

(C) FIFO bypass settlement sequence; two payment priorities

Queued payment sequence	Priority	Amount	
1	01	\$250,000	← Settle
2	01	\$1,000,000	
3	99	\$300,000	
4	99	\$2,000,000	
5	99	\$100,000	

Participant's liquidity in settlement mechanism = \$750,000

Note: FIFO is first in, first out

7.2.3 Gridlock Buster

The Gridlock Buster is Lynx's payment offsetting algorithm, which works alongside the impact intervention process to increase the liquidity efficiency of the system. It is a multi-stage algorithm that attempts to simultaneously offset two or more queued payments made by different participants. The algorithm is divided into a multilateral offsetting stage and a bilateral offsetting stage.

During the multilateral offsetting stage, the algorithm evaluates what would happen to the available liquidity each participant has in the settlement mechanism if different combinations of queued payments were to settle. If a combination of payments can be found where all participants have a liquidity balance greater than or equal to zero, then those payments can be offset. If, however, at least one participant would have a negative liquidity balance, then the payments cannot be offset. Whenever the algorithm identifies a set of offsetting payments, these payments are concurrently settled with real-time finality.

To evaluate different combinations of payments, the algorithm creates a single list of queued payments from all participants. The list is ordered using the same parameters described above, i.e., first by priority level, second by internal sequence number and third by queued time. In the first step of the multilateral offsetting stage, the algorithm checks what the available liquidity of each participant would be if all queued payments were to settle. In the second step, it checks the available liquidity of each participant by sequentially adding payments from the front of the queue (e.g., What would happen if the first queued payment were to settle? What would happen if the first two queued payments were to settle? And so on.). Finally, it checks the available liquidity of each participant by sequentially removing payments from the queue.

The Gridlock Buster then moves to the bilateral offsetting stage. In this stage, the algorithm identifies pairs of participants that have both incoming and outgoing queued payments to each other and creates a list of queued payments for each participant. The bilateral lists are ordered by the same parameters used during the multilateral offsetting stage. For each pair of participants, the algorithm attempts to identify combinations of queued payments that, if settled, would leave both participants with a liquidity balance greater than or equal to zero. The algorithm analyzes the available liquidity of each participant under different combinations of payments by sequentially adding or removing payments from the bilateral lists.

Note that settlement priority levels are obeyed in the Gridlock Buster process, i.e., lower-priority payments from a given participant cannot be settled until all higher-priority payments sent by that participant are settled.

The LSM is the only settlement mechanism configured to use the Gridlock Buster, which is set to run five minutes after an impact intervention process occurs.¹³

7.3 Settlement mechanisms

The remainder of this section provides a detailed discussion of each settlement mechanism.¹⁴

¹³ The system schedules only a single Gridlock Buster process at a time. In other words, if a Gridlock Buster run is already scheduled, any subsequent impact interventions occurring before the scheduled run will not trigger another Gridlock Buster process.

¹⁴ Appendix E summarizes the characteristics of each settlement mechanism.

7.3.1 Real-time mechanism

The RTM is used by participants to track their credit limit, manage their intraday loan and excess liquidity, and settle payments related to interbank lending. It is characterized by (i) no payment queueing, (ii) no payment priorities, (iii) no Gridlock Buster, (iv) no MLR and (v) no NSL.

Before each Lynx payments processing cycle, HABS informs Lynx of each participant's credit limit. Participants then decide the value of intraday liquidity they will transfer to the LSM and the UPM. In addition, participants can use the RTM as a tool for maintaining a buffer of intraday liquidity. This settlement mechanism can be used to settle payments only during Settlement Window 2 for the purpose of interbank lending.¹⁵ It is important to note that the RTM does not have a queue. Therefore, if a participant does not have sufficient RTM capacity, any payment submitted to this settlement mechanism is immediately discarded.

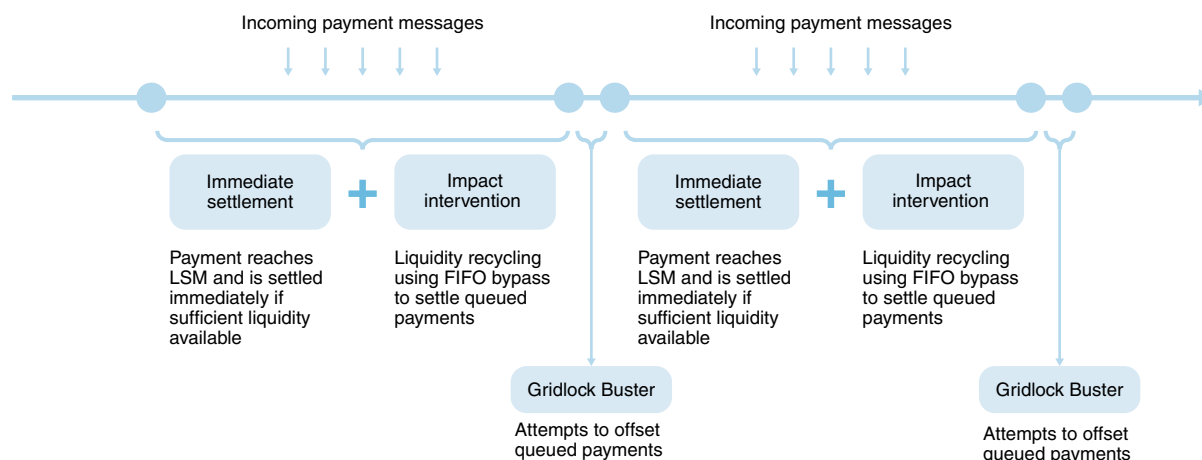
7.3.2 Liquidity saving mechanism

The LSM is designed to reduce the amount of intraday liquidity required to settle payments. It is characterized by (i) payment queueing, (ii) four payment priorities (1, 3, 5 and 99), (iii) impact intervention with FIFO bypass settlement sequence, (iv) Gridlock Buster, (v) MLR and (vi) NSL. Although payments submitted to the LSM tend to be those that can be settled at a later time, participants can also submit time-sensitive payments to this settlement mechanism and manage their settlement through the use of priority levels.

If liquidity is insufficient to settle a payment (or a payment with a higher priority is already queued), the payment will be placed in the LSM queue. The LSM queue provides liquidity savings for queued payments through a combination of liquidity recycling and payment offsetting. Participants are encouraged to use the LSM where appropriate to minimize the extent to which liquidity is spread across settlement mechanisms. The Bank of Canada uses the LSM to send payments to other participants, including the overnight deposits from the previous business day.

The LSM is the only mechanism that uses all three of Lynx's settlement processes: immediate settlement, impact intervention and Gridlock Buster (**Figure 5**). The use of impact intervention with the FIFO bypass settlement sequence allows for more efficient liquidity recycling, while the Gridlock Buster provides liquidity savings by offsetting payments made by different participants.

¹⁵ Payments routed to the RTM during Settlement Window 1 are immediately discarded by Lynx and need to be resubmitted by the participant to another settlement mechanism.

Figure 5: Timeline of liquidity saving mechanism settlement processes

Note: LSM is liquidity saving mechanism; FIFO is first in, first out.

7.3.3 Urgent payment mechanism

Payments routed to this mechanism are those that participants intend to settle immediately or with as little delay as possible. This mechanism is characterized by (i) payment queueing, (ii) single payment priority (99), (iii) impact intervention with FIFO settlement sequence, (iv) no Gridlock Buster, (v) no MLR and (vi) no NSL.

This settlement mechanism is not designed to provide liquidity savings. Nonetheless, the UPM does include a queue as a safeguard against possible timing mismatches between payment submission and funding availability.

7.3.4 Reserved collateral mechanism

The RCM is used for the sole purpose of making payments to the CDS account with the Bank of Canada for the settlement of CDSX-related obligations. It is characterized by (i) payment queueing, (ii) single payment priority (99), (iii) impact intervention with FIFO settlement sequence, (iv) no Gridlock Buster, (v) no MLR and (vi) no NSL.

The use of this mechanism enables participants to pledge securities to the Bank of Canada that have not yet settled in CDSX. The intraday liquidity generated through this pledge can be used only to settle the participant's CDSX settlement obligation. Participants are not required to settle these obligations in the RCM and may choose to settle them in the LSM or the UPM.

Lynx participants can take advantage of the RCM by pledging securities designated as reserved collateral to the Bank of Canada. Once these securities are pledged, the Bank of Canada values them, allocates the value in HABS for Lynx purposes, and informs Lynx of the increase in credit limit. Lynx then initiates an intraday loan for the full amount of the credit limit increase and transfers this liquidity to the RCM. If there is insufficient liquidity to settle a payment in the RCM, the payment is queued. The queue provides flexibility in situations where the payment is received into the RCM before the intraday liquidity. Participants are restricted from transferring intraday liquidity out of this settlement mechanism—this can be done only by the Bank of Canada when prior claims on that collateral are fully satisfied, or by Lynx

when the RCM is closed. Liquidity transferred out of the RCM is moved to the RTM and becomes fungible with all other liquidity. Unsettled payments that remain in the RCM queue at the close of Settlement Window 1 are discarded.

7.4 Conditional release mechanism

The CRM is not a settlement mechanism but rather a tool that participants have at their disposal to temporarily hold payments, releasing them only once a given condition is met. A payment placed in the CRM is said to be *diarized*. Lynx periodically checks diarized payments against the condition for their release. If the condition is met—and no additional conditions apply to the payment—the payment is released into the appropriate settlement mechanism. Payments not released from the CRM at the end of the day are discarded by Lynx. Unlike queueing, where a payment is held within a settlement mechanism until sufficient liquidity is available, a diarized payment cannot be settled until it is released from the CRM into a settlement mechanism.

Conditions that can result in a payment being placed in the CRM include, but are not limited to, the following:

- If a participant specifies that the payment should be settled no earlier than a certain time in the future, then the payment is diarized.
Release condition: The payment is released when the specified time is reached.
- If sending a payment would breach a participant's NSL, then that payment is diarized.
Release condition: The payment is released if the participant either increases its NSL with respect to that counterparty or receives sufficient payments from that counterparty so that the payment can be sent without the NSL being breached.
- If a participant has not allocated sufficient liquidity to meet the MLR in the LSM, then payments sent to the LSM are diarized.
Release condition: The participant allocates liquidity to the LSM equal to or greater than the MLR.
- If a specific settlement mechanism is not open, then payments sent to this settlement mechanism are diarized.
Release condition: Payments are released when the settlement mechanism opens.
- If the system identifies a payment as a potential duplicate, the payment is diarized.
Release condition: The participant verifies the payment is not a duplicate and manually releases it, or the participant verifies the payment is a duplicate and removes it.
- If a participant manually moves a queued payment into the CRM.
Release condition: The participant manually releases the payment.
- If a participant pauses payments to another participant, then all queued payments to that participant are diarized.
Release condition: The participant resumes payments to the participant.

7.5 Throughput targets

Throughput can be defined in terms of both volume and value. Volume throughput is the proportion of the total daily payment volume (i.e., number of payments) settled by a participant by a certain time; similarly, value throughput is the proportion of the total daily payment value settled by a

participant by a certain time. A participant's daily throughput starts at 0% when the Lynx payments processing cycle opens and ends at 100% at the close of the Lynx payments processing cycle.

Throughput targets help reduce intraday liquidity requirements at the system level by promoting synchronization in the flow of payments. When throughput targets are met, participants receive a significant proportion of payments in a timely fashion, enabling them to recycle the incoming liquidity to make their own payments.

The Lynx rules establish both volume and value throughput targets for participants, excluding the Bank of Canada. These are summarized in **Table 3**.

Table 3: Lynx throughput targets

Eastern time	Value throughput target	Volume throughput target
10:00 a.m.	25%	40%
1:00 p.m.	60%	60%
4:30 p.m.	80%	80%

Payments Canada regularly monitors participants' performance against the targets as well as trends over time, and follows up with participants when required.

8 Operating schedule

This section summarizes how the processes discussed in the previous sections fit into the Lynx operating schedule. In particular, it details the system operating hours and key events that take place during the Lynx payments processing cycle, including the opening and closing of the different settlement mechanisms.

Lynx is open during regular business days and closed on weekends and federal statutory holidays.¹⁶ The payments processing cycle in Lynx starts at 12:30 a.m. and ends at 7:00 p.m. The cycle covers the majority of the day to accommodate payment activity from different time zones across Canada, and it facilitates the settlement of high-priority FMI payments throughout the day, including overnight. Participants must be online in Lynx by 8:00 a.m. Participants that are also CLS members must be online in Lynx by 12:30 a.m. to participate in the CLS settlement cycle.

The Lynx payments processing cycle is divided into three periods—or windows—each with a different purpose. Throughout Settlement Window 1, participants conduct their regular payment activities, such as settling client payments and payments on their own behalf. Settlement Window 2 is reserved for interbank lending only. During this window, participants with a short position borrow funds from other participants to repay their intraday loan positions. And in the Finalization Window, participants repay their intraday loans to the Bank of Canada and receive, if required, overnight advances to cover any liquidity shortfalls. These windows are explained in more detail below.

- **Settlement Window 1:** From 12:30 a.m. to 6:00 p.m., Lynx participants conduct their regular payment activities, exchanging payments on behalf of themselves and their clients, including FMIs. The following processes take place during this window:

Time	Process
12:30 a.m.	Lynx opens the UPM and LSM, allowing participants to fund these settlement mechanisms and send and receive payments. Before participants can send and receive payments in the LSM, they must also meet this settlement mechanism's minimum liquidity requirements.
3:00 p.m.	Lynx opens the RCM.
6:00 p.m.	Settlement Window 1 closes.

¹⁶ The list of federal statutory holidays when Lynx is closed can be found on the [Systems Closure Schedule](#) page of Payments Canada's website.

- **Settlement Window 2:** From 6:00 p.m. to 6:30 p.m., Lynx participants can engage only in inter-FI payments (i.e., payments between FIs on their own behalf, not on behalf of clients) and only if the sending participant has the consent of the receiving participant. During this window, participants attempt to “flatten” their position through interbank lending. In other words, participants who are “short”—i.e., do not have enough funds to repay their intraday loan balance with the Bank of Canada—attempt to secure funds from participants who are “long”—i.e., have excess funds. The following processes occur during this window:

Time	Process
6:00 p.m.	<p>Lynx closes the RCM and sweeps (i.e., transfers) the balance of funds, if any, in this settlement mechanism to the RTM account of each participant. Remaining queued payments are discarded.</p> <p>Lynx closes the UPM and sweeps funds in this settlement mechanism to the RTM account of each participant. Remaining queued payments are discarded.</p> <p>Lynx performs a final Gridlock Buster run, then closes the LSM and sweeps funds in this settlement mechanism to the RTM account of each participant. Remaining queued payments are discarded.</p> <p>Lynx enables participants to use the RTM to send and receive payments. Only inter-FI transfers are accepted by the system during this window (client transfers are immediately discarded).</p>
6:30 p.m.	Settlement Window 2 closes.

- **Finalization Window:** From 6:30 p.m. to 7:00 p.m., the intraday loans from the Bank of Canada are repaid and participants receive, if required, fully collateralized overnight advances to cover any shortfalls. During this period, participants can no longer settle payments in Lynx. The following processes take place during the Finalization phase:

Time	Process
6:30 p.m.	<p>Lynx uses the remaining liquidity in each participant's RTM account to repay the intraday loans granted by the Bank of Canada. If a participant's intraday loan has not been fully repaid, a fully collateralized overnight advance from the Bank of Canada is granted to repay the participant's intraday loan.</p> <p>Lynx sweeps the RTM balance of each participant to the Bank of Canada's RTM account.</p> <p>The end-of-day positions for all Lynx participants (settlement account and loan balances) are sent to the Bank of Canada, which then applies these balances to each participant's account in HABS.</p>
7:00 p.m.	Finalization Window closes.

After the Finalization Window closes, the system carries out a number of additional operations in preparation for the next cycle, including:

- generating and transmitting any end-of-day reports (e.g., account statements)
- closing the current cycle and opening a new one
- opening the RTM (although the RTM opens before the start of the payments processing cycle, Lynx participants cannot send or receive any payments during this time)
- updating participants' credit limits

Table 4 summarizes the three windows of the Lynx payments processing cycle.

Table 4: Lynx payments processing cycle

		Settlement Window 1	Settlement Window 2	Finalization Window
Start time		12:30 a.m.	6:00 p.m.	6:30 p.m.
End time		6:00 p.m.	6:30 p.m.	7:00 p.m.
Accepted payment activity		Client transfers Inter-FI transfers	Inter-FI transfers only	Participants cannot send or settle any additional payments during this period
Settlement mechanisms	RTM	Open: participants can transfer liquidity to and from the RTM but cannot send or receive payments	Open: participants can only send and receive payments with the RTM	Closed
	UPM	Open	Closed	Closed
	LSM	Open: participants must meet MLR before sending or receiving payments	Closed	Closed
	RCM	Open (from 3:00 p.m.)	Closed	Closed
Key processes		<ul style="list-style-type: none"> UPM opens (12:30 a.m.) LSM opens (12:30 a.m.) RCM opens (3:00 p.m.) 	<ul style="list-style-type: none"> RCM closes, funds swept to RTM (6:00 p.m.) UPM closes, funds swept to RTM (6:00 p.m.) Final Gridlock Buster run (6:00 p.m.) LSM closes, funds swept to RTM (6:00 p.m.) Participants can send and receive payments in the RTM (6:00 p.m.) 	<ul style="list-style-type: none"> RTM liquidity used to repay intraday loan Positions communicated to HABS Fully collateralized overnight advance granted to participants that did not have sufficient funds to repay intraday loan Participants' RTM balances swept to Bank of Canada's RTM account and then applied to HABS

Note: FI is financial institution, RTM is real-time mechanism, MLR is minimum liquidity requirement, UPM is urgent payment mechanism, LSM is liquidity saving mechanism, RCM is reserved collateral mechanism, and HABS is High-Availability Banking System.

9 End-of-cycle procedures

This section describes the end-of-cycle procedures that take place in Settlement Window 2 and the Finalization Window. It covers the closing of the RCM, UPM and LSM at the beginning of Settlement Window 2 as well as the Lynx processes related to intraday loan repayment, overnight advances and communication of participants' final position to HABS during the Finalization Window.

9.1 Settlement Window 2

9.1.1 Closing the reserved collateral mechanism, urgent payment mechanism and liquidity saving mechanism

At the start of Settlement Window 2 (6:00 p.m.), Lynx begins the end-of-cycle process and closes all settlement mechanisms except the RTM. Lynx first closes the RCM and then the UPM, transferring the balance in these intraday liquidity accounts to the RTM. This maximizes the RTM capacity available to each participant to settle any remaining queued payments in the LSM.

Lynx attempts to settle any remaining LSM payments by executing a final run of the Gridlock Buster that makes use of each participant's available RTM capacity. The LSM is then closed and any remaining liquidity balance is transferred to each participant's RTM account.

When these settlement mechanisms are closed, any queued or diarized payments are discarded. No further payments can settle in these mechanisms once the close-out process begins.

9.1.2 Interbank lending

The purpose of Settlement Window 2 is to provide participants with the opportunity to reduce their intraday loan balance (if any) through interbank lending, which decreases the overnight advance otherwise required from the Bank of Canada. During Settlement Window 2, participants are permitted to send only interbank payments. In addition, the sending participant can send only those payments that a receiving participant has agreed to receive.

Lynx participants (including the Bank of Canada) can send and receive Lynx payments only between each other. Therefore, the value of payments sent and received across the system will always be equal. This means that while some participants will be net senders and others will be net receivers, in aggregate the net payments across all Lynx participants will be zero. As a result, participants that are net senders will not have enough intraday liquidity available to repay their intraday loan. Similarly, participants that are net receivers will have excess intraday liquidity after they repay their intraday loan and will deposit these funds with the Bank of Canada overnight when Lynx is closed. The Bank of Canada returns these funds at the beginning of the next Lynx payments processing cycle plus overnight interest earned.

The example below illustrates what occurs when a participant enters Settlement Window 2 in a short position. This participant has two options to repay its intraday loan: it either takes an interest-bearing overnight advance from the Bank of Canada or attempts to find another participant willing to lend its excess intraday liquidity at a lower rate than that charged by the Bank of Canada.

Participant A takes an intraday loan advance at the start of the day totalling:	\$100
Participant A makes payments during the day totalling:	(\$50)
Participant A receives payments during the day totalling:	\$25
Participant A has an intraday liquidity balance at the start of Settlement Window 2 of:	\$75
Participant A has an intraday loan balance to repay of:	\$100
Participant A has a shortfall of \$25 and cannot repay its intraday loan. Thus, the participant must take an overnight advance of \$25 to fully repay the intraday loan.	

Participants that enter Settlement Window 2 in a long position have, by definition, sufficient liquidity available to repay their intraday loan.

9.2 Finalization Window

9.2.1 Intraday loan repayment and overnight advances

During the Finalization Window, Lynx automatically repays each participant's intraday loan by debiting the participant's RTM account and crediting its intraday loan account. If a participant has insufficient liquidity to fully repay its intraday loan at this point, Lynx automatically processes an overnight advance from the Bank of Canada to the participant and then repays the remaining intraday loan balance. The advance is made by debiting the Bank of Canada's RTM account and crediting the participant's RTM account. While these advances are automatically processed by Lynx, they are fully collateralized legal obligations between the Bank of Canada and the participant. As such, they must be repaid before the end of the following Lynx payments processing cycle, with interest, through a Lynx payment. Although the advance is processed in Lynx, Lynx does not track the overnight advance as an obligation to be repaid. The accounting for the obligation is done outside of Lynx on the books of the Bank of Canada.

9.2.2 Communication of final balances to the High-Availability Banking System

Upon completion of the overnight advances and the repayment of intraday loans, each participant will have either a balance in its RTM intraday liquidity account or an obligation to the Bank of Canada. These represent the net activity of each participant for the day. The sum of all participants' net positions is always zero. Lynx closes by transferring the intraday liquidity balances from participants in long positions to the Bank of Canada's RTM account, resulting in a zero balance. Lynx then communicates these values and those of the overnight advances to HABS in order for the participants' settlement accounts at the Bank of Canada to be updated to reflect the net activity of the day.

10 The Lynx Operational Resilience Framework

Lynx has been designated as a systemically important FMI by the Bank of Canada. The Bank of Canada's [Risk Management Standards for Designated FMIs](#) highlight the importance of a robust operational risk framework. In observance of these standards and to protect the safety and soundness of the payment system, Payments Canada has established the Lynx Operational Resilience Framework (ORF), designed to mitigate operational risk and ensure that participants in Lynx can continue to settle payments if operations are disrupted at the primary Lynx data centre.

The Lynx ORF sets out business continuity procedures that follow a successive methodology using layers of resiliency. This includes:

- redundancy at the primary site
- the ability to switch immediately to a secondary site to bring services back online—all data required to operate and process settlement operations are synchronously replicated from the primary site to the secondary site, ensuring no data loss
- if the secondary Lynx site is unavailable and neither site is expected to be able to resume operations on the same day, participants have well-defined processes to follow to manually exchange and settle payments across the books of the Bank of Canada

When an emergency incident occurs and impacts Lynx operations, the President of Payments Canada is responsible for determining the best course of action, in consultation with the Lynx Emergency Committee and with the prior agreement of the Bank of Canada.

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Appendix A: Acronyms

Acronym	Definition
ACSS	Automated Clearing Settlement System
BIS	Bank for International Settlements
CDS	Canadian Depository for Securities
CPMI	Committee on Payments and Market Infrastructures
CRM	conditional release mechanism
DNS	deferred net settlement
FI	financial institution
FIFO	first in, first out
FMI	financial market infrastructure
HABS	High-Availability Banking System
IOSCO	International Organization of Securities Commissions
LSM	liquidity saving mechanism
LVTS	Large Value Transfer System
MLR	minimum liquidity requirement
NSL	net send limit
ORF	Operational Resilience Framework
PCRN	payment confirmation reference number
PFMI	Principles for Financial Market Infrastructures
RCM	reserved collateral mechanism
RTGS	real-time gross settlement
RTM	real-time mechanism
SWIFT	Society for Worldwide Interbank Financial Telecommunication
UPM	urgent payment mechanism

Appendix B: Glossary of key terms

Term	Definition
Automated Clearing Settlement System (ACSS)	A payment system owned and operated by Payments Canada that clears retail payments, including paper-based payment items (mostly cheques), pre-authorized debits and credits, as well as small-value electronic payment items, such as point-of-sale debit card or automated banking machine transactions.
clearing	A process that may include one or more of the following: matching, validating, reconciling, and checking payments against risk controls before settlement.
CDSX	Canada's securities clearing and settlement system provided by the Canadian Depository for Securities.
CLS Bank	Financial institution that operates a payment-versus-payment system aimed at mitigating settlement risk arising from foreign exchange transactions.
conditional release mechanism (CRM)	A mechanism in Lynx that temporarily holds payments, releasing them to the specified settlement mechanism once an assigned condition is met.
credit limit	A participant's credit limit in Lynx is equal to the assessed value (after applying haircuts) of the collateral allocated to Lynx by that participant.
deferred net settlement (DNS) system	A system that enables the settlement of payment obligations between counterparties on a net basis at some later time.
first in, first out (FIFO) settlement sequence	A settlement sequence in Lynx that requires, for each priority level, payments to be settled in the same order in which they are received in the settlement mechanism (unless they have been manually re-sequenced).
FIFO bypass settlement sequence	A settlement sequence in Lynx that, while still attempting to settle payments based on the order they are received, allows for queued payments to be skipped due to insufficient liquidity so that subsequent queued payments with smaller values can be settled. It is important to note that priority levels are still respected in FIFO bypass, meaning that all higher-priority payments must be settled before lower-priority payments can settle.
finality	A payment is considered final and irrevocable when the payment amount is transferred from the sending participant to the receiving participant and book entries are made to the Lynx accounts of both participants.
Gridlock Buster	A multi-stage algorithm in Lynx that attempts to simultaneously offset two or more queued payments on a multilateral and/or bilateral basis.
High-Availability Banking System (HABS)	The system used by the Bank of Canada to support critical banking operations, including the management and valuation of collateral pledged by financial institutions.
haircut	The difference between the market value of a security and its collateral value. Haircuts are often taken by a lender of funds to protect the lender (should the need arise to liquidate the collateral) from losses caused by declines in the market value of the security.
immediate settlement	In Lynx, immediate settlement occurs whenever a participant has sufficient liquidity to settle a newly submitted payment and no other payments are in the queue with the same or a higher priority level.
impact intervention	A liquidity recycling process in Lynx that attempts to sequentially settle the queued payments of all participants, i.e., funds that a participant receives from incoming payments are used to settle the participant's own queued payments.
intraday liquidity	Funds available to participants to settle payments throughout a Lynx payments processing cycle. Participants have three sources of intraday liquidity in Lynx: (i) intraday loans obtained by pledging eligible collateral to the Bank of Canada; (ii) deposits held overnight at the Bank of Canada; and (iii) payments received from other Lynx participants, including the Bank of Canada.
minimum liquidity requirements (MLR)	The minimum amount of intraday liquidity that each participant must transfer from its intraday loan account to a settlement mechanism at the beginning of a Lynx payments processing cycle in order to send and receive payments in that settlement mechanism. The liquidity saving mechanism is the only settlement mechanism in Lynx with an MLR.
net send limit (NSL)	A limit set by a participant that is the maximum net value of payments that a participant is willing to send to another participant.
participant	A member of Payments Canada approved to participate in Lynx in accordance with the Lynx by-law.

Term	Definition
payment priority levels	Payment priority levels allow participants to rank their payments according to settlement importance, which affects how each participant's queued payments are ordered.
payments processing cycle	<p>The portion of the Lynx operating schedule during which payments are processed. The payments processing cycle in Lynx starts at 12:30 a.m. and ends at 7:00 p.m. (Eastern Time). It is divided into three windows, each with a different purpose.</p> <ul style="list-style-type: none"> ▪ Settlement Window 1 (12:30 a.m. to 6:00 p.m.) is the period during which participants conduct their regular payment activities, such as settling client payments and payments on their own behalf. ▪ Settlement Window 2 (6:00 p.m. to 6:30 p.m.) is reserved for interbank lending only. During this window, participants with short positions borrow funds from other participants to repay their intraday loan positions. ▪ Finalization Window (6:30 p.m. to 7:00 p.m.) is reserved for the repayment of the intraday loans provided by the Bank of Canada.
real-time gross settlement (RTGS) system	A system that enables final settlement of individual payment obligations on a real-time gross basis by means of transfers of funds held in participants' accounts at the settlement agent (typically the central bank).
settlement	An act that discharges financial obligations between two or more parties.
settlement mechanism	<p>A facility configured to settle payments in a way that meets specific business needs. Lynx participants can settle payments using four different settlement mechanisms:</p> <ul style="list-style-type: none"> ▪ real-time mechanism (RTM) ▪ urgent payment mechanism (UPM) ▪ liquidity saving mechanism (LSM) ▪ reserved collateral mechanism (RCM)

Appendix C: Key differences between Lynx and the Large Value Transfer System

The table below compares Lynx, Canada's new high-value payment system, with its predecessor, the Large Value Transfer System (LVTS). Additional details about Lynx can be found in the main text of this document; more information about the Large Value Transfer System can be found in the [primer](#) on the Bank of Canada's website (Arjani and McVanel 2006).

	Lynx	LVTS
Risk model	RTGS Cover-all defaulter-pay model	Hybrid DNS Survivor-pay and defaulter-pay model
Settlement mechanisms / streams	Four settlement mechanisms: <ul style="list-style-type: none"> ▪ real-time mechanism ▪ urgent payment mechanism ▪ liquidity saving mechanism ▪ reserved collateral mechanism 	Two tranches: <ul style="list-style-type: none"> ▪ Tranche 1 ▪ Tranche 2
Settlement asset	Central bank money	Central bank money
Clearing risk controls	Sufficient intraday liquidity must exist to settle each payment on a gross basis without overdraft Intraday liquidity is provided by the Bank of Canada through fully collateralized intraday loans No other conditions exist that restrict the payment from being settled	Tranche 1: <ul style="list-style-type: none"> ▪ multilateral net debit caps Tranche 2: <ul style="list-style-type: none"> ▪ combination of multilateral and bilateral net debit caps Debit caps are backed by collateral pledged to the Bank of Canada
Settlement	Settlement entries are made for each payment individually in real time Finality, irrevocability and settlement certainty achieved through the RTGS model	Settlement entries are made after the close of each cycle: <ul style="list-style-type: none"> ▪ payments cleared during a cycle are netted by novation providing finality and irrevocability ▪ settlement obligations for each participant are calculated on a multilateral net basis ▪ settlement certainty is provided through a combination of survivor-pay, defaulter-pay and a central bank residual guarantee
Source of liquidity efficiency	Liquidity saving mechanism: <ul style="list-style-type: none"> ▪ FIFO bypass ▪ liquidity recycling (continuous) ▪ queued payment offsetting algorithm (periodic) 	Tranche 1 and Tranche 2: <ul style="list-style-type: none"> ▪ jumbo queue and associated offsetting algorithm Tranche 2: <ul style="list-style-type: none"> ▪ bilateral credit extension between participants ▪ collateralization calculated as a percentage of the largest bilateral credit limit extended
Credit risk	Credit risk between participants is mitigated by the RTGS model Credit and market risk on intraday loans by the Bank of Canada is mitigated by lending against eligible collateral subject to haircuts and concentration limits intraday	Credit risk between participants is mitigated by the combination of survivor-pay and defaulter-pay models, and the Bank of Canada's residual guarantee

Note: RTGS is real-time gross settlement; DNS is deferred net settlement; FIFO is first in, first out.

Appendix D: Overview of risk management in Lynx

The real-time gross settlement (RTGS) risk model prevents credit risk exposures from being created between participants in Lynx. This is because payment obligations are settled immediately as they are cleared. Accordingly, participants cannot default on their Lynx settlement obligations. Nonetheless, participants are subjected to other financial risks in Lynx, including intraday liquidity risk. These risks are managed by participants with a variety of tools. This appendix identifies the financial risks that participants are exposed to as well as the tool kit available to monitor and manage these risks.

1 Risk identification

- **Credit risk:** The RTGS risk model for Lynx ensures that payments are final and irrevocable once they have been settled. Since settlement occurs immediately following clearing, Lynx participants do not have credit risk exposures to other Lynx participants.
- **Default risk:** Participants cannot default on their payments in Lynx because the risk controls ensure that sufficient liquidity exists before settling payments. Lynx employs a cover-all model, which requires all payments to be fully collateralized in order to settle.
- **Market risk:** The Bank of Canada is exposed to market risk if, after haircuts are applied, the market value of the securities pledged as collateral decreases below the amount of a participant's intraday loan account balance. The Bank of Canada mitigates this risk by defining eligible securities to be pledged as collateral and using appropriate haircuts for each category of security.
- **Intraday liquidity risk:** Intraday liquidity risk is the primary risk of concern for participants in Lynx. Intraday liquidity risk for participants other than the Bank of Canada can be defined as:
 - insufficient liquidity to settle all payment obligations on a given day, or
 - insufficient liquidity at a point in time during the day to settle a time-sensitive payment on time

2 Monitoring and managing intraday liquidity risk

Payments Canada is not exposed to intraday liquidity risk because it is not a Lynx participant. Monitoring and managing this risk is the responsibility of Lynx participants. However, as the operator of Lynx, Payments Canada is responsible for ensuring that participants understand the risks they are exposed to and the appropriate tools they can access to control their risk.

Category	Tool	Risk management relevance
Legal framework	Throughput targets	Throughput targets help reduce intraday liquidity requirements at the system level by promoting synchronization in the flow of payments. When throughput targets are met, participants receive a significant proportion of payments in a timely fashion, enabling them to recycle the incoming liquidity to make their own payments.
	Minimum liquidity requirements (MLRs)	MLRs ensure that all participants contribute liquidity to the system and encourage participants to use a specific settlement mechanism (the liquidity saving mechanism [LSM]), which helps increase the overall liquidity efficiency of the system by reducing the number of separate “liquidity pools.”
Automated in Lynx	Queueing	Payment queueing is fundamental to liquidity savings and enables the enhanced liquidity recycling and payment offsetting available in the LSM. Queues also prevent urgent payment mechanism (UPM) and reserved collateral mechanism (RCM) payments from being discarded due to timing differences between the registering of a payment and the transfer of intraday liquidity.
	First in, first out (FIFO) bypass	The FIFO bypass settlement sequence in the LSM enables enhanced liquidity recycling by “skipping” queued payments when sufficient liquidity is not available so that subsequent queued payments with smaller values can be settled.
	Gridlock Buster	This multi-stage algorithm attempts to simultaneously offset two or more queued payments on a multilateral and/or bilateral basis. The Gridlock Buster reduces the amount of time payments spend in the queue and further increases the liquidity efficiency of the system.
Discretionary	Real-time monitoring	Lynx provides participants with the ability to monitor intraday liquidity risk in real time through the use of dashboards, reports and application programming interfaces (APIs). These tools allow for the monitoring of many different aspects of liquidity risk, including: <ul style="list-style-type: none"> ▪ balances of intraday liquidity accounts in each settlement mechanism and intraday loan account ▪ actual position and estimated position on a multilateral and bilateral basis ▪ status of individual payments (queued, diarized, settled, etc.)
	Queue management tools	Lynx allows participants to view and manage their payments in each of the settlement mechanism's queues. Participants can: <ul style="list-style-type: none"> ▪ alter the order of queued payments by changing priority levels or re-sequencing payments ▪ increase or decrease the priority level assigned to a payment ▪ cancel a payment ▪ remove a payment from the queue by moving it to the conditional release mechanism (CRM)
	Intraday liquidity buffer	Participants have the flexibility to reserve excess intraday liquidity by either not fully borrowing against their credit limit or by leaving intraday liquidity in the real-time mechanism (RTM). This intraday liquidity buffer can be transferred to other settlement mechanisms as required to settle time-sensitive payments.
	Payment settlement priorities	Payment priority levels allow participants to rank their payments according to settlement importance, which affects how each participant's queued payments are ordered.
	Net send limits (NSLs)	The use of NSLs provides the following benefits: <ul style="list-style-type: none"> ▪ Participants are able to manage liquidity by avoiding one-sided outflows. ▪ Payments are more synchronized. ▪ Payment behaviour is influenced by encouraging participants to submit payments as early as possible.
	Pause payments	Participants can efficiently pause settlement of payments to one, some or all other participants in the event of an emergency. This functionality pauses the settlement of existing queued payments as well as all future payments that Lynx processes until the pause is released by the participant.

Appendix E: Summary of Lynx settlement mechanisms

Settlement mechanism	Real-time mechanism	Liquidity saving mechanism	Urgent payment mechanism	Reserved collateral mechanism
Purpose	<ul style="list-style-type: none"> ▪ Track credit limit ▪ Manage intraday loan ▪ Hold excess liquidity ▪ Interbank lending in Settlement Window 2 	<ul style="list-style-type: none"> ▪ Liquidity efficiency ▪ Settle payments that are less time-sensitive 	<ul style="list-style-type: none"> ▪ Settle time-sensitive payments 	<ul style="list-style-type: none"> ▪ CDSX settlement obligations
Key features	<ul style="list-style-type: none"> ▪ No payment queueing ▪ No payment priorities ▪ No Gridlock Buster ▪ No net send limits 	<ul style="list-style-type: none"> ▪ Payment queueing ▪ First in, first out (FIFO) bypass settlement sequence ▪ Four payment priorities ▪ Gridlock Buster ▪ Net send limits ▪ Minimum liquidity requirements 	<ul style="list-style-type: none"> ▪ Payment queueing ▪ FIFO settlement sequence ▪ Single payment priority ▪ No Gridlock Buster ▪ No net send limits 	<ul style="list-style-type: none"> ▪ Payment queueing ▪ FIFO settlement sequence ▪ Single payment priority ▪ No Gridlock Buster ▪ No net send limits
Operating window	12:30 a.m.–7:00 p.m.	12:30 a.m.–6:00 p.m.	12:30 a.m.–6:00 p.m.	3:00 p.m.–6:00 p.m.