

# SCDx Initial Design Brief

*A Canadian network for imports exports and interprovincial trade*

Draft 0.1 | 26 October 2026 | Recommendations for discussion

## Recommended direction

Develop Supply Chain Data Exchange as a federated network connecting the organizations and systems that move goods and information. Its scope includes imports, exports, and province-to-province trade by ship, truck, and rail, including the handoffs at ports, terminals, and warehouses. Participants should be able to reuse verified information with authorized partners while retaining control of their systems and data. SCDx is driven by the Digital Supply Chain Lab at Simon Fraser University.

SCDx needs a common foundation for identity, shared data meaning, permissions, and reliable exchange. Commercial transactions, transport operations, and government submissions should connect through this foundation using the standards appropriate to each function. This brief proposes the design direction and validation work; it does not describe an implemented network or agreed institutional mandate.

## What the email establishes

Somnuk Keretho's assessment, forwarded by Andrew Hamilton on 15 October 2026, supports a federated approach that builds on existing Canadian systems. It recommends business process analysis and improvement before large system decisions, followed by data harmonization, automation, and cross-border exchange. Somnuk explicitly describes his understanding of Canada as limited and his findings as preliminary. [1]

His strongest governance recommendation is an empowered national steering mechanism supported by a dedicated programme office. An international advisory committee would provide independent expertise. The email suggests roughly 8 to 12 experts and quarterly meetings, but these are proposals rather than commitments. Andrew raises SFU DSCL as a possible convening platform. [1]

The email addresses a trade Single Window initiative. SCDx has a broader remit: business-to-business exchange and domestic multimodal movement belong in the design alongside regulatory trade processes. The SWIC proposal referenced in the email is absent from the literature folder, so its scope and institutional assumptions remain unverified.

## Canadian starting point

Canada already operates Customs Single Window, CARM, ACI/eManifest, and CERS. These support different regulatory functions and have different access routes. SCDx should preserve authoritative agency decisions and use supported interfaces through authorized participants. CARM advertises an API catalog, but its available operations and access conditions require confirmation. [2–5]

Stephen's observation about fax use is a useful discovery hypothesis. The research reviewed here does not establish a national prevalence estimate. Record actual fax, email, PDF, portal, EDI, and manual re-entry practices in each validation journey before estimating benefits.

## Network scope and validation journeys

Cover the full chain from suppliers and producers through manufacturers, carriers, intermediaries, storage and distribution to buyers and receiving facilities. Connect foreign counterparties where needed. Brokers, regulators, financial institutions, and insurers participate according to their role. Ports and warehouses are important network nodes where responsibility and information change hands.

| Journey         | Illustrative physical path                                                                               | Information to follow                                                                                                             |
|-----------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Import          | Foreign supplier → ship → Canadian port → rail → truck → warehouse → buyer                               | Order and shipment references, documents, arrival and transfer events, regulatory status, receipt.                                |
| Export          | Canadian producer → truck or rail → warehouse or terminal → port → ship → foreign receiver               | Booking, packing and dispatch, export declaration references, certificates where required, loading and delivery status.           |
| Interprovincial | Supplier in one province → truck or rail → warehouse or transfer terminal → receiver in another province | Order and dispatch data, custody transfers, inventory receipt, proof of delivery, invoice references and applicable requirements. |

These are validation scenarios, not selected corridors or commodity commitments. Together they must exercise ship, rail, truck, port, and warehouse handoffs. A transfer may involve a different operator, a change of mode, or storage. Each transition needs clear responsibility for reporting and correcting its status.

### Keep the business objects distinct

An order, order line, consignment, transport leg, container, pallet, warehouse receipt, declaration, and invoice are related but different objects. One order may split across several loads; a container may combine goods from multiple orders. SCDx should preserve these relationships and each participant's identifiers, including the scheme and issuer, rather than assign one shipment number to everything.

### Reuse data across the complete process

Support the Approve–Buy–Ship–Pay process identified in the email. Exchange permit and certificate information where required, commercial order and invoice data, movement and receipt events, and payment status or references where authorized. Payment execution and trade finance remain with the responsible services unless a later use case establishes a need to integrate them.

Domestic trade should use the same commercial and logistics foundation. Attach regulatory rules to the goods, activity, jurisdiction, and route concerned. Border declarations apply to relevant import and export flows; their fields should not become mandatory for every domestic shipment.

### Design for different levels of digital readiness

Offer connectors for existing enterprise, transport, and warehouse systems, including legacy EDI. Provide a simple web interface and assisted onboarding for smaller firms. Any transitional extraction from fax or PDF should retain the original and require verification of consequential fields before onward submission. Reusable structured data should reduce the number of places a participant enters the same information.

## International standards to reuse

Adopt a layered framework. Each SCDx implementation profile should specify its use case, required fields, identifier schemes, standard versions, mappings, business rules, and error handling. Agency and partner requirements determine the supported profile; the newest published version may not be the version an endpoint accepts.

| Purpose                           | Foundation                                                            | Use in SCDx                                                                                                                                                                         |
|-----------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Programme and interoperability    | UN/CEFACT Recommendations 33 34 35 36                                 | Guide Single Window design, data simplification, legal arrangements, and interoperability. These are recommendations, not a network protocol. [7]                                   |
| Shared business meaning           | UN/CEFACT Buy Ship Pay and Multimodal Transport reference data models | Anchor definitions of parties, goods, consignments, transport, and documents. Select a practical subset for each journey. [8]                                                       |
| Border and regulatory data        | WCO Data Model                                                        | Map the regulatory subset to WCO concepts and to the precise Canadian filing requirements. WCO announced version 4.3.0 in July 2026. [9]                                            |
| Traceability events               | GS1 EPCIS 2.0 and Core Business Vocabulary 2.0                        | Describe shipping, receiving, aggregation, and relevant sensor events. Orders, invoices, and declarations need their own models. [10]                                               |
| Identifiers and locations         | UN/LOCODE and relevant GS1 identifiers                                | Use recognized location, product, party, and logistics-unit schemes where they fit. Preserve source identifiers and mappings; facility detail may require more than UN/LOCODE. [11] |
| Ocean container operations        | DCSA standards                                                        | Use relevant booking, bill of lading, and tracking profiles with participating carriers. Confirm release, access, and conformance requirements. [12]                                |
| Rail truck and warehouse exchange | UN/CEFACT transport models and partner profiles                       | Map existing rail and road messages and warehouse interfaces. Use EPCIS for appropriate events. Validate terminal and operator code lists with actual partners. [8,10]              |
| Document inventory                | ICC DSI Key Trade Documents and Data Elements                         | Use its 36-document framework to locate reusable fields and established standards. It is a mapping resource rather than a new universal document format. [13]                       |

Preserve working UN/EDIFACT or other partner EDI through explicit mappings. Add sector requirements such as product certificates or dangerous goods data when the commodity requires them. If air cargo enters the scope later, IATA ONE Record offers a defined data model, API, and security framework. [8,14]

The first technical deliverable should be a small set of SCDx profiles and executable conformance checks. Shared labels such as “released” must distinguish customs release, carrier release, terminal availability, and permission to collect cargo.

## Proposed network architecture

Use a shared coordination layer with participant-operated or delegated exchange endpoints. Data may move directly between authorized endpoints or through an agreed managed exchange service. The routing choice should follow availability, confidentiality, cost, and partner capability requirements.

| Component                          | Required behavior                                                                                                                                                                                                      |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Participant systems and connectors | Connect supplier and buyer systems, transport and warehouse systems, ports, terminals, brokers, and authorized government channels. Translate each supported profile without losing source meaning.                    |
| Shared coordination services       | Maintain a verified organization and endpoint directory, schema and code-list registry, conformance service, trust rules, and limited audit metadata. Restrict discovery of commercially sensitive shipment metadata.  |
| Permissions and delivery           | Authorize access by organization, delegated role, shipment relationship, purpose, and field. Support secure requests, event subscriptions, acknowledgements, retries, and an owned exception queue.                    |
| Records and evidence               | Keep business records at the agreed authoritative source. Govern any caches or managed copies through explicit retention, hosting, recovery, and access rules. Record who supplied, changed, and received information. |

## Define a common exchange contract

Every message or event should carry a unique identifier, type, schema and profile version, issuer, relevant business-object references, creation time, event time where applicable, and correlation references. Include units and time zones, document status and revision links, and the permissions or policy context needed to evaluate access. A transport leg should identify its mode, operator, origin, destination, and related goods or equipment.

Assign an authoritative issuer to each kind of fact. Preserve conflicting reports and their provenance until the agreed resolution process determines the operational view. A regulator's acknowledgement must remain distinguishable from an SCDx delivery acknowledgement or an operator's estimate.

## Make exchange reliable and accountable

Assume messages can arrive twice or out of order. Require duplicate-safe processing, delivery receipts, delayed-message recovery, and explicit stale-data indicators. Agree which records remain available during an endpoint outage and how queued exchanges recover. Sensitive shared metadata requires the same access discipline as message content.

Support corrections, cancellations, and document replacement without silently overwriting history. Notify affected recipients when a record changes. Revoking access stops future authorized retrieval but cannot retrieve copies already disclosed. Verify issuer authority and document status; a scan or digital signature alone does not establish every recipient's acceptance or the legal effect of an original.

Use encryption, managed credentials, auditable delegation, and tested incident recovery. Define access, hosting, retention, and onward-sharing rules before exchanging live sensitive data. Select specific technology products only after validating these requirements with participating organizations.

## Delivery and governance

Organize the initial programme around all three journeys. Establish common definitions and trust rules once, then validate them across imports, exports, and interprovincial movement. Select named participants and routes according to willingness, available interfaces, representative handoffs, and measurable information problems.

| Stage               | Concrete deliverable and completion condition                                                                                                                                                                            |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Assess and simplify | Map current steps, actors, documents, systems, costs, delays, and manual entry for each journey. Identify who can authorize changes and remove unnecessary steps.                                                        |
| Specify and connect | Agree the shared data profiles, authority rules, participation agreement, and access model. Exchange sample data between independently implemented connectors, including an EDI partner and a smaller firm.              |
| Validate operations | Exercise real modal and organizational handoffs, exception resolution, document corrections, and outage recovery. Use live regulatory interfaces only after access and testing are confirmed; label simulated responses. |
| Evaluate and extend | Compare results with the baseline for each journey. Resolve defects, establish operating costs and service ownership, and confirm readiness before adding participants or foreign connections.                           |

### Responsibilities to establish

A national steering body needs an explicit mandate to resolve cross-agency and industry issues. A funded programme office should coordinate delivery and accountable workstream owners. Participants remain responsible for their own systems, records, and authorized disclosures. The network operator's liability, funding, membership, pricing, and exit rules require agreement.

An independent international advisory committee can review standards, process analysis, architecture, and results. The [Digital Supply Chain Lab](#) at Simon Fraser University is the driving force behind SCDx. National governance arrangements and the network operator's responsibilities still require agreement.

### Evidence required before expansion

Test split and consolidated loads, conflicting status reports, a missing document, rejected submissions, expired delegation, unauthorized discovery, duplicate events, and an offline endpoint. A small participant should complete its part without an integration team. Define named exception owners and resolution expectations.

Measure repeated data entry, manual touches, submission errors, information delay, handoff delay, participant onboarding effort, and exchange recovery. Establish definitions and baselines separately for each journey, then agree numerical targets. Separate improvements due to information exchange from delays caused by physical capacity or unrelated conditions.

### Dependencies and decisions still open

Confirm the sponsor, operator, participants, corridors, commodities, interface permissions, budget, and schedule. Inventory related Canadian initiatives. CBSA connectivity can involve approved EDI providers and acceptance testing. [6] Bill C-39 proposes an Enabling Digital Trade Act and was at House committee consideration on 26 October 2026. Its proposed provisions require commencement orders. Recheck legislative status and legal acceptance for each document and route before operational use. [15]

## Sources and evidence boundaries

Primary sources checked on 26 October 2026. Numbered references support factual descriptions; the architecture, delivery sequence, and validation scenarios are recommendations. The local email is preliminary advice and does not establish a national baseline or approved institutional arrangements.

[1] Local source. Somnuk Keretho assessment forwarded by Andrew Hamilton, 15 October 2026. [literature/Somnuk Email.pdf](#)

[2] Canada Border Services Agency. [Customs Single Window overview](#)

[3] Canada Border Services Agency. [CARM overview](#); [CARM API catalog](#)

[4] Canada Border Services Agency. [How commercial clients use EDI including ACI and eManifest](#)

[5] Canada Border Services Agency. [Canadian Export Reporting System user guide](#)

[6] Canada Border Services Agency. [EDI connection requirements](#); [Acceptance testing](#)

[7] UNECE UN/CEFACT. [Recommendation 33 revised in 2020](#); [Recommendation 34](#); [Recommendation 35](#); [Recommendation 36](#)

[8] UNECE UN/CEFACT. [Reference models and standards](#); [Buy Ship Pay derived vocabulary](#); [Standards including UN/EDIFACT](#)

[9] World Customs Organization. [Data Model overview](#); [July 2026 announcement of version 4.3.0](#)

[10] GS1. [EPCIS and CBV overview](#); [EPCIS and CBV 2.0 normative artefacts](#)

[11] UNECE and GS1. [UN/LOCODE](#); [GS1 system architecture and identifiers](#)

[12] Digital Container Shipping Association. [Standards](#); [Shipment journey reference](#)

[13] International Chamber of Commerce Digital Standards Initiative. [Key Trade Documents and Data Elements framework](#); [Interactive document glossary](#)

[14] International Air Transport Association. [ONE Record overview](#)

[15] Parliament of Canada. [Bill C-39 status](#); [First reading text Part 2 Division 8 and section 303](#)

[16] Simon Fraser University. [Digital Supply Chain Lab official website](#)

Not yet verified: participant readiness, endpoint API coverage, government access permissions, corridor volumes, commodity requirements, legal acceptance by document type, national fax prevalence, and achievable benefits. No interviews, live integrations, or production exchanges were performed for this brief.