

What Does a Data-Rich Border Look Like?

How Australia's cargo reporting environment could evolve from repeated regulatory reporting toward trusted reuse of the data business already creates

An exploratory, operationally-grounded explainer written for the people who run cargo reporting every day - customs brokers, freight forwarders, carriers, terminal operators, ICS administrators, and ABF and DAFF operational staff - as well as for policy readers. This document incorporates its Operational Annex as Attachment A.

Prepared by Peter Carter

June 2026

How to read this paper

This paper is written to be read by people who have never heard of - and do not need to hear about - the technical standards behind it. The main body uses plain English. Where a technical idea genuinely matters, it is named once, explained in everyday terms, and the detail is left to the Operational Annex (Attachment A), which also contains four “day in the life” case studies and an operational identifier reference.

A second discipline runs throughout: aspiration and established fact are never written in the same voice. Every substantive claim is tagged so you can see what weight it carries.

The evidence tags used in this paper

[PROVEN] Established practice or obligation. Firm evidence.

[EMERGING] Being implemented overseas. A direction of travel, not a ready-made Australian answer.

[FUTURE-STATE] A concept worth testing, with safeguards. Not asserted as mature.

[NEEDS TESTING] Better answered by industry or by ABF/DAFF. Flagged, not assumed.

Worked examples and figures marked *illustrative* use indicative or synthetic data to make a pattern concrete - not to assert a fact.

A note on evidence about the current system. Every statement in this paper about how the ICS works today is drawn from the ABF’s own ICS manuals, the Customs Act 1901, the Biosecurity Act 2015, the FCRM and CRST consultation papers, or published ABF guidance. Where the published record is silent or behaviour varies in practice, the paper says so rather than inferring capability.

Contents

How to read this paper	2
Contents.....	3
1. Executive summary	5
2. What this paper is actually proposing.....	6
What happens today.....	6
What is proposed.....	6
What does NOT change	6
What changes	6
3. How we got here, and where this is heading.....	7
Why the system looks the way it does	7
What is genuinely new.....	7
The shift in one idea	8
4. Why government is exploring this	8
4.1 Revenue integrity.....	8
4.2 Biosecurity.....	9
4.3 E-commerce growth.....	9
4.4 Productivity.....	9
4.5 Regulatory modernisation	10
4.6 National security	10
4.7 Market access	10
4.8 Future readiness	11
5. What this means for existing ICS users.....	11
By role	11
6. The current state: how cargo reporting works today	12
6.1 The cascade.....	12
6.2 Declarations, thresholds and the two regulators	13
6.3 Why replacing the system alone may not be enough	13
7. What changes - the same facts, sourced once	14
8. Worked example 1 - a sea container import	14
8.1 Today.....	14
8.2 In a data-rich model.....	15
9. Worked example 2 - biosecurity, and a vehicle import	15
9.1 Biosecurity: fresh produce	15
9.2 A vehicle import.....	16
10. Worked example 3 - e-commerce at parcel scale.....	16

11. What if this doesn't work?	17
12. Stakeholder outcomes	18
13. International direction - lessons, not templates.....	18
14. What must exist first, and how to get there.....	19
14.1 The likely high-leverage building blocks	19
14.2 A staged transition, not a big bang	20
15. Conclusion.....	20
Part A - A day in the life	22
A1. A customs broker	22
A2. A freight forwarder	23
A3. An ABF risk officer.....	24
A4. A DAFF officer	24
Part B - Operational identifier reference	25
Part C - The technical building blocks, explained.....	26
C1. Giving information a clear label (identifiers and linked data)	26
C2. Evidence you can check (verifiable credentials)	26
C3. How the pieces connect (the 'trust graph' and the UN Transparency Protocol).....	27
C4. What this does and does not prove - a summary	27

1. Executive summary

Australia's cargo reporting framework, delivered through the Integrated Cargo System (ICS), has underpinned border revenue, biosecurity and trade facilitation for two decades. It remains mission-critical. Border and customs operations are the Commonwealth's second-largest source of revenue: in 2023–24 they generated \$15.4 billion, comprising \$13.8 billion in customs duty, \$1.1 billion in passenger movement charges and \$451 million in import processing charges.

In the same year the system processed 4.4 million import and self-assessed clearance declarations and cleared roughly 69 million air and sea cargo consignments, while the border carried a total GST liability assessed of \$45.7 billion.¹ These are not marginal numbers, and they explain why the underlying model is approached with care.

The ABF's FCRM and CRST consultations recognise that the reporting model the ICS encodes - tightly sequenced, cascading, transaction-by-transaction reporting - reflects the supply chains of the early 2000s. This paper does not argue about which system should replace the ICS. It asks a more practical question.

The question is not "how do we replace the ICS?" but: **when the same information has already been created and shared once, what must still be reported again?**

Most of the information regulators need is created early, by business, in the ordinary course of trade - in the order, invoice, packing list, certificate and transport instruction. Today that information is frequently re-keyed into separate regulatory reports, late and in sequence. A data-rich model would let it be created once, identified, linked and reused where trust, governance and the law permit. The next chapter explains exactly what that means in plain English, including what does not change.

The honest version of the idea is narrower than the slogan. Logistics and conformity information - movement, custody, treatment, test results, certificates - is genuinely rich, source-generated and reusable. The information government most wants for revenue and risk - true value, beneficial ownership, accurate classification, substantiated origin - is precisely the information that is least reliable in commercial systems, because parties have incentives to misstate it. Proving who said something, and that it was not altered, is not the same as proving it is true. This paper therefore treats reliable identification and verifiable evidence as powerful aids to reuse and risk targeting, and as inputs to regulatory decisions - never as substitutes for them.

On that basis the paper makes five observations and leaves the operational judgements to those closer to them: source the data once, close to its origin; identify products, parties and locations reliably; separate early risk awareness from final clearance; treat biosecurity as a first-order constraint; and transition in stages, with parallel running and fallback rather than a big-bang replacement.

Chapter 11 - "What if this doesn't work?" - sets out, without softening, the ways the idea could fail: poor source data, fraud, weak offshore seller data, credential abuse, verification failures, adoption resistance, SME

¹Revenue figures: Australian National Audit Office, Administration of goods revenue (2023–24). Declaration volumes and GST liability: Australian Taxation Office, GST administration annual performance report 2023–24 (Department of Home Affairs). Consignment volume: Department of Home Affairs reporting, 2023–24.

impact and liability disputes. None is a reason not to explore the direction. Each is a reason to explore it as a tested, staged transition rather than a leap of faith.

2. What this paper is actually proposing

This chapter is deliberately written in plain English. There are no technical terms in it. If you read only one chapter, read this one.

What happens today

The same information is created several times and reported several times. A supplier writes the goods, the value and the origin on an invoice. A forwarder writes much of it again on a house bill. A carrier records the voyage and the container. A terminal records what actually arrived. A broker types most of it again into a customs declaration. The container number, the bill number and the importer's ABN can be entered by hand four or five times before the goods are cleared. Every re-entry is a chance for a typo, a delay or a mismatch - and the full picture often comes together only late in the journey.

What is proposed

Information is created once, given a clear label so everyone is talking about the same thing, connected to the goods and parties it belongs to, and then reused - instead of being typed in again and again. The party that knows a fact first records it once; everyone downstream who is entitled to see it can reuse it by reference, rather than re-keying it. Government draws on information that already exists, where it can be trusted, rather than asking for it to be recreated.

Figure 1. The same facts, entered many times - or once. Today (top) the container, bill and ABN are re-keyed by each party in turn. In a data-rich model (bottom) they are stated once on a shared record, and each party adds only what it creates. The broker still classifies the goods and still lodges the declaration.

What does NOT change

This is the part that matters most to the people who run the system today, so it is stated plainly:

- **The ICS remains.** It stays the official system of record for cargo reporting and declarations.
- **Customs declarations remain.** Import declarations and self-assessed clearances are still lodged.
- **Brokers remain.** Classification, valuation and origin are still professional judgements, and the broker still signs the declaration.
- **Carriers and forwarders remain.** Their roles and responsibilities do not disappear.
- **Biosecurity controls remain.** DAFF's hold and release powers, inspections and conditions are unchanged.
- **Regulatory powers remain.** The ABF's and DAFF's legal powers to question, audit, hold, seize and penalise are not reduced.

What changes

- **Less re-keying** of the same facts by different parties.

- **Better visibility** of a shipment, earlier in its journey.
- **Better data quality** because a fact is captured once, at the point it is known.
- **Better evidence** because a certificate or authorisation can be checked, not just trusted.
- **Earlier risk assessment** because regulators see structured information sooner.

In one sentence: the goods, the parties and the controls all stay the same - what changes is that information is created once and reused, instead of being recreated at every step.

3. How we got here, and where this is heading

If you live and breathe the ICS, the idea in the last chapter can feel like it is asking you to throw away how cargo reporting works. It is not. It helps to see where today's system came from, because the data-rich direction is the next step in a long evolution - not a sudden break with it. This chapter is the mental model that makes the rest of the paper click into place.

Why the system looks the way it does

Australia's cargo systems were built, sensibly, around the things that mattered most when they were designed: the shipment and the consignment as the unit of control, and the classification of products so the right duty and taxes could be assessed and reported. That made complete sense. When the rules and systems were written, you could not reliably identify an individual item across organisations, you could not easily link one company's data to another's, and you certainly could not check a document's authenticity electronically in seconds. So the system did the sensible thing for its time: it asked each party to report its shipment, and it classified goods by hand for revenue.

Every stage since has kept that basic shape while changing the technology underneath it. Paper and stamps gave way to electronic messages; many separate systems were brought together into the ICS. But the model stayed the same: report the shipment, re-key the facts at each step, classify for revenue. The cascade you work in every day is the early-2000s model, faithfully carried forward.

Figure 2. How cargo systems have evolved, and where they are heading. Each era kept the same basic shape - report the shipment, re-key, classify for revenue - while the technology underneath changed. The data-rich direction is the next step: identify the items and parties, reuse the documents partners already exchange, and verify claims rather than re-collecting them.

What is genuinely new

The reason this conversation is happening now is that capabilities exist today that simply did not exist when the current rules were written. Three in particular:

- **Reliable identification and national standards.** It is now practical to identify products, parties and locations consistently across organisations - and the national standards to do so are relatively recent.
- **Linking data across organisations.** Information held by different parties can now be connected on demand, without pooling everything into one database - a capability that is still young and still maturing.

- **Verifying claims by cryptographic proof.** A certificate or authorisation can now carry tamper-evident proof of who issued it, so it can be checked rather than merely trusted. These methods continue to evolve as computing and physics advance.

That last point matters more than it first appears. Because the underlying methods keep advancing, this is not a problem you solve once and lock down. It is an ongoing shift, and it calls for an approach that can keep evolving rather than a single fixed design frozen at one moment in time.

The shift in one idea

The mindshift, plainly

The old question was: “how do we report and classify each shipment?”

The new question is: “the items, parties and documents are already identified and exchanged - what must we still report again, and what can we simply reuse and verify?”

Nothing about this throws away the ICS, declarations or your expertise. It changes what the system is organised around - from recreating reports about shipments, to reusing trusted information about identified items and parties.

Hold that mental model as you read on. The drivers in the next chapter are the reasons government finds this shift worth exploring; the worked examples show it in your day-to-day terms; and the “what if this doesn’t work?” chapter is candid about where it could fail.

4. Why government is exploring this

This chapter is about government’s reasons, not about technology. A reform only earns attention if it helps solve real problems. Eight drivers are set out below. For each, the paper states the current challenge, why today’s approaches struggle, how a data-rich model might help, and the risks that come with it - because none of these gains is automatic.

4.1 Revenue integrity

The current challenge	Customs duty (\$13.8bn) and GST assessed at the border (\$45.7bn liability) depend on correct value, classification and origin. Misclassification, undervaluation and origin fraud all erode revenue.
Why today’s approach struggles	Declared value, classification and origin are largely taken on trust at the point of entry, and checked after the fact. Free-text descriptions make patterns hard to see.
How a data-rich model might help	Structured, identified data makes anomalies easier to detect (undervaluation, consignment-splitting), and verified party identity makes some fraud harder. Where each line carries a product identity, AI and identifier-to-classifier models can also support more consistent tariff classification - as decision support the broker confirms, not a replacement for judgement. Audit can be continuous and targeted rather than periodic.
Risks and limits	A verified invoice still proves only what the seller claimed, not the truth of the value or origin. Verification must be paired with scrutiny, not treated as proof.

4.2 Biosecurity

The current challenge	DAFF must keep pests and disease out while keeping export markets open. So much of this turns on certificates, treatment records and traceability - evidence that must be trusted.
Why today's approach struggles	At parcel scale, the data DAFF receives is often thin and free-text. Certificates arrive as paper or PDFs that are slow to check and easy to forge.
How a data-rich model might help	Earlier visibility of structured commodity, origin and treatment data; certificates that can be checked at the point of risk assessment; better targeting even at parcel scale.
Risks and limits	Hold/release integrity must be preserved as a first-order constraint. The biosecurity-relevant data elements are for DAFF to specify, not for this paper to assume.

4.3 E-commerce growth

The current challenge	Low-value, direct-to-consumer parcels are surging. The model was designed when low-value cargo was a marginal stream, not a dominant one.
Why today's approach struggles	A declaration per parcel does not scale to billions of items, and the seller - often offshore - is the least accountable party in the chain.
How a data-rich model might help	Structured minimum data supplied once by the platform or carrier (by batch or interface, not per parcel), with risk segmentation and post-border audit, can lift the quality of data without a declaration on every parcel.
Risks and limits	This relocates the problem to the quality and accountability of offshore seller data. It is a policy and enforcement question as much as a data one.

4.4 Productivity

The current challenge	Recreating the same information many times, across up to 29 agencies with an interest in imported goods, is a large and recurring cost to industry and government.
Why today's approach struggles	Each agency and each party tends to collect and re-key its own copy, so the same fact is validated repeatedly.
How a data-rich model might help	Reusing information already created upstream - "tell us once" - reduces duplication and reporting burden, and is consistent with the national productivity and data agenda.
Risks and limits	Productivity claims must be independently validated before they are booked as savings. Removing duplication can also remove useful independent checks.

4.5 Regulatory modernisation

The current challenge	Government has committed to “Tell Us Once”, the Simplified Trade System and whole-of-government information reuse, but legacy reporting cannot easily deliver them.
Why today’s approach struggles	Sequential, system-specific reporting was not designed for reuse across agencies, so each reform tends to add a new channel rather than reuse an existing one.
How a data-rich model might help	A shared, identified, reusable information base lets multiple regulators draw on the same data, aligning the reform with commitments already made.
Risks and limits	Whole-of-government reuse needs shared governance and clear responsibility, or it simply moves the duplication problem around.

4.6 National security

The current challenge	Understanding who is really behind an importation - the parties, their relationships and beneficial ownership - matters for security as well as revenue.
Why today’s approach struggles	Identity is often asserted and checked manually, and legitimate business identities can be misused (“piggybacking”) to conceal involvement.
How a data-rich model might help	Reliable party identification and verified authorisations improve entity resolution and supply-chain visibility, making misuse harder and relationships clearer. A sovereign verifiable business identity (a vABN) would let a counterparty be confirmed in seconds rather than by manual look-up.
Risks and limits	Greater visibility must be balanced against privacy and proportionality, and beneficial-ownership data is only as good as the registers behind it.

4.7 Market access

The current challenge	Australian exporters depend on receiving countries trusting Australian certificates and provenance claims.
Why today’s approach struggles	Paper and PDF certificates are slow to issue, easy to forge and must often be re-keyed for each market.
How a data-rich model might help	Verifiable export certificates and provenance, building on DAFF’s eCert progress, can be faster to issue, harder to forge and easier for other countries to verify.
Risks and limits	International recognition depends on alignment with global approaches and on other countries’ readiness - it cannot be delivered unilaterally.

4.8 Future readiness

The current challenge	Digital trade, trusted data sharing and international interoperability are advancing whether or not Australia keeps pace.
Why today's approach struggles	A reporting model built for the early 2000s is poorly placed to plug into emerging international data exchanges.
How a data-rich model might help	Aligning with international approaches now positions Australia to interoperate later, and to keep market access and competitiveness as others digitise.
Risks and limits	Standards and international models are still maturing; committing too early to any one of them carries its own lock-in risk.

The common thread

Across all eight drivers the pattern is the same: the potential gains are real but conditional, and the conditions are mostly about governance, assurance and accountability - not technology. That is why this paper treats the "what if it doesn't work?" chapter and the infrastructure and transition chapters as the decisive ones.

5. What this means for existing ICS users

If you lodge cargo reports or declarations today, this is the chapter that answers the question you are actually asking: how does this affect me? The short answer is that your role, your system access and your obligations stay; what changes is how much you have to re-key and how early you can see a complete picture.

Figure 3. What stays the same, and what changes, for the people who use the ICS today. Nothing in the left-hand column is altered by the data-rich direction; the right-hand column is the set of intended benefits.

By role

If you are a...	What stays the same	What could change for you
Customs broker	You classify, value and determine origin; you sign and lodge the declaration; you carry the accountability.	Source data arrives identified rather than as a PDF to retype; declarations can be pre-populated for your review; AI can suggest a tariff code you confirm; you can verify a client's identity before acting; fewer chases for missing data.
Freight forwarder	You consolidate, issue house bills and report your part.	You add only what you create, once; you can confirm a counterparty is genuine before acting; less re-supply of data already shared; outturn discrepancies surfaced against a shared record.
Carrier	You report voyage, conveyance and arrival.	Your data links to the shipment by reference; fewer mismatches caused by re-keyed identifiers.

If you are a...	What stays the same	What could change for you
Terminal operator	You outturn cargo and report custody, surplus and short-landed goods.	Custody events attach to the shared record; reconciliation is easier when identifiers are consistent.
ICS administrator	The ICS remains the system of record; existing connections keep working during transition.	A standards-based data and identity layer could run alongside the ICS for selected streams, with fallback - not a forced cutover.
ABF officer	Your legal powers and the declaration framework remain.	Earlier, structured data for risk; verified identity to counter piggybacking; more precise targeting.
DAFF officer	Hold/release powers, inspections and conditions remain.	Earlier structured commodity and treatment data; certificates you can verify at source; reuse of trusted export evidence.

The reassurance, stated plainly

No part of this direction removes the ICS, your declarations, your role or your powers. A data-rich model is not a replacement of the people and obligations in the chain; it is a change to how often the same information has to be created and entered. Any move in this direction would be staged, run in parallel with today's reporting, and kept reversible - not switched on overnight.

6. The current state: how cargo reporting works today

To see what a data-rich model would change, it helps to be precise about the model in place. Everything in this chapter is drawn from the ABF's own ICS manuals and the FCRM consultation paper.

6.1 The cascade

Cargo reporting is sequential. Each party reports to the ICS in turn, and lower-level reports cannot reach a cleared status until higher-level reporting is complete. For air cargo, the system links house air waybills to a master air waybill, and cargo on lower-level reports does not receive a clear status until it has been fully reported, including the ultimate consignee.²

The voyage number is a key matching (linking) field across every report in the chain; linking fields cannot be amended, so if a voyage number is reported incorrectly the cargo report must be withdrawn and re-lodged - industry must get it right for matching to work.³

Reporting timeframes are set by legislation: a sea cargo report at least 48 hours before the vessel's estimated arrival at its first Australian port (24 hours for voyages of 24–48 hours, and 12 hours for voyages under 24

²ABF, Import Cargo Reporting Manual (Air), Module 3 — Air Cargo Reports: "Cargo described on subsequent (lower level) reports will not receive a clear status until it has been fully reported ... including ultimate consignee." The freight-forwarder indicator notifies Customs that lower-level reporting is expected.

³ABF, Frequently Asked Questions — Cargo Reporting ("Voyage number is a key matching field for all reports in the cargo reporting chain and cannot be amended"); ABF, Cargo Status — A Beginners Guide ("Linking fields on cargo reports cannot be amended ... the cargo report will need to be withdrawn and a new (corrected) report" lodged).

hours), and an air cargo report at least two hours before arrival, or one hour for flights shorter than two hours.⁴

Arrival is reconciled through outturn reports lodged by stevedores and depots, which record any discrepancy between the cargo reported and the cargo actually received - including short-landed, surplus, damaged or pillaged cargo - and movements of cargo still under customs control are handled through underbond movement requests, which can be “chained” and “stacked”.⁵

Figure 4. The current-state cascade: each party reports in sequence into the ICS, which feeds ABF and DAFF. The structural friction - lateness, duplication and cascading failure - is a symptom of one root cause: information is recreated rather than reused.

6.2 Declarations, thresholds and the two regulators

Goods above A\$1,000 are cleared on a full Import Declaration (N10); goods valued at A\$1,000 or less arriving as cargo are cleared by a Self-Assessed Clearance (SAC). A SAC can take three forms - a Cargo Report SAC made by the cargo reporter as part of the cargo report, a short-format SAC, or a full-declaration-format SAC - and all are lodged electronically in the ICS. Most SAC declarations are made with the cargo report, though not all cargo reporters make Cargo Report SAC declarations.⁶

Release and revenue clearance are generally coupled. Both the ABF and DAFF rely on ICS data and on hold/release signalling; the Simplified Trade System taskforce has identified 29 government agencies with an interest in imported goods, and the ABF shares most declaration information with other agencies that conduct their own checks.⁷

6.3 Why replacing the system alone may not be enough

The deeper issues in the current model - duplication and re-keying, fragmented identity assurance, variable data quality, unclear data ownership and delayed access - are problems of the reporting model first, and the system second. Replacing the application that runs the cascade, without changing the model that produces the cascade, risks re-encoding the same patterns in newer technology. This is the case for treating the model question (FCRM) as logically prior to the system question (CRST).

Questions for government - current state

Which information that regulators need is already created in commercial documents, and where is it re-keyed today rather than reused? How much current duplication is genuinely redundant, and how much is

⁴Sea and air cargo reports are made under section 64AB of the Customs Act 1901 and lodged in the ICS. Timeframes per ABF, Frequently Asked Questions — Cargo Reporting, and ABF sea cargo reporting requirements (48h / 24h / 12h tiers by voyage length); air timeframes per ABF Import Cargo Reporting Manual (Air), Module 3.

⁵ABF, Import Cargo Reporting Manual (Sea), Module 12 — Sea Cargo Outturn (outturn results record discrepancies between cargo reported and cargo actually received; damage and pillage indicators); Module 1 — cascade reporting, underbond movement requests, chaining and stacking. The Integrated Cargo Report (ICR) allows the cargo report and an underbond movement request to be lodged together, the cargo-report component being processed first.

⁶ABF, Import declarations / SAC guidance (abf.gov.au); ABF Industry Imports Manual, Module 19 — Self Assessed Clearance (three SAC types; FID threshold currently A\$1,000). The Customs Act 1901 sets the threshold and the section 64AB reporting obligation.

⁷Practical Law ANZ, Importing Goods: Overview (Australia), citing Simplified Trade System Implementation Taskforce research; DAFF, Self-assessed clearance cargo guidance.

independent validation worth keeping? What is the minimum a regulator must verify (versus collect) for release, for clearance, and for biosecurity?

7. What changes - the same facts, sourced once

In a data-rich model the commercial documents business already creates become the primary source, and government consumes trusted information rather than recreating it. The general principle is to source each fact from the party that creates or controls it, and to record who supplied it and when, so accountability stays explicit even when many parties contribute.

Figure 5. Information lineage: who creates each fact, and who reuses it. Each fact is sourced once, from the party best placed to know it, then reused by reference - with a record of who supplied it and when.

Two clarifications keep this realistic. First, regulators rarely need open access to a business's internal systems: sharing defined, identified data elements achieves the same purpose with far less intrusion and clearer liability. Second, a single trusted source is also a single point of failure and of fraud; the gain from removing duplication must be weighed against the assurance that independent validation sometimes provides. The design answer is a clear record of who supplied each fact, defined rules for who fixes errors, and risk-based audit - not blind trust in one feed.

A note on the technical terms behind this

Some readers will have heard terms such as “linked data”, “verifiable credentials”, “trust graphs” and the UN Transparency Protocol. In plain terms: these are agreed ways to give information a clear label, to connect related information, and to attach a tamper-evident electronic signature so a certificate or authorisation can be checked rather than merely trusted. You do not need to understand them to follow this paper. For those who want the detail, the companion Operational Annex (Attachment A) explains each one and how it maps to cargo reporting.

8. Worked example 1 - a sea container import

[FUTURE-STATE] *Illustrative, using example identifiers of the kinds already used in cargo reporting. It is not a claim about any organisation.*

The shipment **Container:** MSCU1234567 **Master bill:** OOLU123456789 **Voyage:** MAERSK VOYAGE 123A
Importer ABN: 12 345 678 901 **Import declaration:** N10-1234567

8.1 Today

The supplier issues an invoice and packing list. The forwarder consolidates and issues house bills, re-entering consignor, consignee and routing. The carrier reports MAERSK VOYAGE 123A and container MSCU1234567. The terminal outturns the container on arrival. The broker re-keys product, value and origin into declaration N10-1234567, determines classification and valuation, and lodges it. The container number, the bill OOLU123456789 and the ABN 12 345 678 901 are entered by hand several times, and the complete picture is often available only late.

8.2 In a data-rich model

The container, the bill and the ABN are stated once on a shared shipment record. The forwarder, carrier and terminal each add only what they create, linked to MSCU1234567. The broker draws the source data into N10-1234567 rather than re-keying it. Classification, valuation and origin remain the broker's determinations - but increasingly the broker is supported rather than starting from a blank field: where each line carries a product identity, identifier-to-classifier models and AI assistants can propose a likely tariff classification for the broker to confirm or correct. The broker still signs the declaration, and the regulator can confirm who provided each fact and that certificates have not been altered - rather than re-collecting the data.

8.3 A note on AI-assisted classification

[FUTURE-STATE] Classification is where this support is most visible, and where the discipline of the paper matters most. Tools that map a product identity (such as a GTIN) to a suggested tariff code, and AI models that read a structured invoice and propose classifications, can remove much of the manual lookup that fills a broker's day. But they suggest; they do not decide. The same fluency that makes them useful lets them be confidently wrong - a plausible code for a genuinely ambiguous good (the bamboo-versus-wood grey area is a classic example). A data-rich model should therefore treat AI classification as reviewable decision support, keep the licensed broker accountable for the lodged code, and require that suggestions be explainable. Used this way, AI raises throughput and consistency without moving the legal responsibility - which stays exactly where it is today.⁸

Figure 6. A customs broker's import job, before and after. Classification stays the broker's call - but in the future state it is supported by AI and identifier-to-classifier models that suggest a tariff code from the product identity, which the broker reviews and remains accountable for. What changes most is the re-keying around that judgement.

What changes, and what does not

Changes: re-keying and its error risk fall; a complete picture is available earlier; party identity is verifiable, reducing piggybacking risk.

Does not change: the broker's accountability for N10-1234567; the regulator's right to verify, audit and intervene; the need to scrutinise value and origin because incentives to misstate them persist.

9. Worked example 2 - biosecurity, and a vehicle import

[FUTURE-STATE] *Illustrative. Two short cases: a biosecurity consignment and an individually-identified vehicle.*

9.1 Biosecurity: fresh produce

The evidence DAFF relies on **Property Identification Code (PIC)**, treatment certificate, phytosanitary certificate, container number and commodity code - each created by the party best placed to know it.

Today these certificates often arrive as paper or PDFs, slow to check and easy to forge, and the commodity is described in free text. In a data-rich model, the PIC links the consignment back to the property; the treatment and test certificates can be checked at the point of risk assessment; and the commodity carries a structured

⁸Consistent with WCO work on the use of AI and machine learning in tariff classification, and with Australian professional-licensing requirements that place accountability for a declaration with the licensed customs broker. The capability is emerging; accuracy on ambiguous goods must be measured before reliance.

code rather than free text. DAFF targets earlier and better, and - crucially - its hold and release signalling is preserved and, if anything, made more reliable. The biosecurity-relevant data elements are for DAFF to specify.

Figure 7. The DAFF conformity network. The supply chain (top) generates evidence - PIC, treatment and test certificates, commodity code - that links into a checkable chain. The same evidence serves both biosecurity on imports and market access on exports, subject to a firm constraint on hold/release integrity.

9.2 A vehicle import

A vehicle is the clearest case of an individually-identified good. The Vehicle Identification Number JT2BF22K7W0123456 identifies one specific vehicle. Today its details are re-keyed across the import declaration, compliance and registration processes. In a data-rich model the VIN is the anchor: the build, compliance and origin facts attach to it once, and each downstream process reuses them by reference. The determination of duty, value and compliance still rests with the accountable parties - the VIN identifies the vehicle reliably; it does not, by itself, determine its tariff treatment or value.

The point both cases make

Neither the PIC nor the VIN belongs to any one standards organisation - they are identifiers already in everyday use. A data-rich model is about using identifiers that already exist consistently, not about adopting any particular provider's scheme.

10. Worked example 3 - e-commerce at parcel scale

[FUTURE-STATE] *Illustrative. A parcel identified by platform, parcel identifier, seller identifier and importer.*

Low-value, direct-to-consumer parcels are the clearest pressure on the current model, and the place where a data-rich approach is at once most valuable and most fragile. The scale is striking: the European Commission reports 4.6 billion low-value consignments entered the EU in 2024, roughly double 2023, with around 91% from China, and volumes reported near 5.9 billion in 2025.⁹

Major economies are responding: the United States removed its US\$800 de minimis exemption for all countries from 29 August 2025, and the EU introduces an interim per-item duty from July 2026 ahead of a data-centric Customs Data Hub mandatory in 2034.¹⁰

Traditional reporting struggles here for a structural reason: a declaration per parcel does not scale to billions of items, descriptions are often free-text, and the seller - frequently offshore - is the least accountable party in the chain. This is the uncomfortable truth the model must confront: the data-rich approach works best for an established importer with a stable supply chain, and is weakest exactly where the volume growth is.

Figure 8. Why parcel scale changes the economics. Per-parcel declaration (left) does not scale; structured data shared once by the platform or carrier, with risk segmentation and post-border audit (right), changes what is feasible - though it depends on the quality of offshore seller data, which remains the weak point.

⁹European Parliament, "EU targets low-value imports via e-commerce platforms" (2025); European Commission e-commerce communication.

¹⁰The White House, Executive Order 14324 (2025); Council of the EU, customs duty rules for small parcels (February 2026); European Commission, EU Customs Reform / EU Customs Data Hub.

The change in economics comes from sourcing structured minimum data - platform, parcel identifier, seller identifier, importer, item and value - from the party that holds it earliest, by batch or interface rather than per-parcel manual declaration; segmenting risk by commodity, origin, platform, seller and history rather than by value alone; and relying on post-border audit and anomaly detection rather than universal pre-clearance checking. In Australia most low-value cargo already clears via SAC, frequently as a Cargo Report SAC made with the cargo report, so the lever is less “more declarations” than “better-structured data for risk” - which is exactly the direction the ABF’s FCRM work signals through ideas such as a dedicated e-commerce pathway that obtains richer data from overseas marketplaces.

The honest tension

A data-rich model does not fix poor offshore seller data; it relocates the problem to verifiable seller identity and platform accountability. Its value at parcel scale therefore depends on whether platforms can be required - or incentivised - to supply structured, identified data, and on whether seller credentials can be made trustworthy. That is a policy and enforcement question as much as a data-architecture one.

11. What if this doesn’t work?

The strongest paper is not the one with the fewest weaknesses; it is the one that addresses them openly. This chapter critiques the paper’s own thesis. Each failure mode below is plausible, and several are reasons to treat the data-rich model as a tested transition rather than an assumed destination.

Failure mode	Why it could undermine the model	What would have to be true to manage it
Poor source data	If the data created upstream is wrong or incomplete, reusing it spreads the error faster than re-keying would.	Data quality measured at source; lineage so errors are traceable; the right to fall back to independent collection.
Fraud	Bad actors can supply false-but-well-formed data, and a tidy structured record can look more trustworthy than it is.	Verification paired with risk-based scrutiny; anomaly detection; never treating “verified” as “true”.
Offshore seller quality	The parties least accountable to Australian law sit exactly where parcel volume is growing fastest.	Platform accountability and enforceable obligations; seller identity that is actually checkable.
Credential abuse	A stolen or misissued electronic credential could be used to assert a false identity or claim.	Strong issuance controls, revocation that works, and authoritative registers behind the credentials.
Verification failures	If checking a credential is slow, unreliable or unavailable, it cannot be relied on at the border.	Verification services that are fast, resilient and degrade gracefully, with clear fallback.
Adoption resistance	If industry sees cost and risk shifting onto it with little benefit, uptake stalls and the model fails in practice.	Clear benefits for each party; no liability shift; assisted pathways; voluntary, incentivised onboarding.
SME impact	Enterprise-grade obligations could disadvantage smaller traders and the brokers who serve them.	Low-tech, broker-assisted pathways guaranteed; obligations proportionate to capability.

Failure mode	Why it could undermine the model	What would have to be true to manage it
Liability disputes	When many parties contribute, responsibility for an error can blur and end up with whoever is easiest to pursue.	Responsibility allocated by data element, with clear, pre-agreed correction rules.

The honest bottom line

If source data is poor, if platforms cannot be held to account, if credentials can be abused or cannot be checked, or if industry will not adopt it, then a data-rich model will not deliver its promised benefits - and could do harm by lending false confidence to bad data. None of these is fanciful. The prudent response is to prove the model empirically, on bounded streams, with independent validation of any economic claims, before relying on it - and to keep the existing system running underneath until the evidence is in.

12. Stakeholder outcomes

A data-rich model only earns support if it works for each party in the chain. The table sets out plausible outcomes, with the conditions that must hold for the gains to be real. Outcomes are conditional on the governance, legal and adoption questions in Chapters 11 and 14 being resolved.

Stakeholder	Potential gains	What must be true for the gains to be real
ABF	Earlier risk visibility; verifiable party identity to counter piggybacking; targeted audit; protection of the \$13.8bn duty base.	Value and origin still scrutinised; lineage auditable; release not decoupled from revenue protection.
DAFF	Verifiable conformity and traceability; earlier targeting at parcel scale; faster, harder-to-forge export certificates.	Hold/release integrity preserved; DAFF a co-equal designer; biosecurity data elements DAFF-specified.
Treasury / PC	Productivity gain from less duplication across 29 agencies; lower compliance burden; better-targeted enforcement.	Benefits independently validated before being booked; transition cost and risk realistically scoped.
Industry	Less re-keying and error; stable interfaces; faster clearance for trusted, well-identified trade.	No liability shift onto intermediaries; professional judgement retained; assisted SME pathways.
Consumers	Safer products through better targeting; faster delivery for low-risk goods; more provenance transparency.	Risk targeting genuinely improves, not just data volume; privacy and proportionality maintained.

13. International direction - lessons, not templates

Overseas experience offers evidence, but it is not directly portable: Australia must account for DAFF biosecurity integration, customs revenue, the Trusted Trader context, ICS dependencies and industry readiness.

[PROVEN] New Zealand's Trade Single Window lets information submitted once be reused across border agencies within government. The WTO Trade Facilitation Agreement establishes pre-arrival processing, risk management, post-clearance audit and authorised-operator treatment; the WCO SAFE Framework adds advance cargo information and the trusted-operator concept.¹¹

[EMERGING] Singapore's Networked Trade Platform reuses commercial data across many parties. The EU is moving to a data-centric model in which parties submit information independently and a complete dataset is assembled progressively, with a Data Hub mandatory by 2034 and a "trusted" trader category. The EU is phasing this over more than a decade - a useful signal that data-rich reform is achievable but not instant.¹²

Read the difficulty, not just the destination

Several widely-cited programmes - including the UK's trust pilots and single-trade-window work - have had mixed published results and shifting timelines. Treating any of them as proof rather than as experiments-in-progress would misread the evidence. The transferable lessons are principles - submit once and reuse, source-based contribution, progressive assembly, shared identifiers, risk-tiered treatment - not platforms. Australia's own audit history of major cargo system re-engineering, and the CRST paper's own 7–10 year estimate, reinforce the same caution.

14. What must exist first, and how to get there

A data-rich model depends on shared capabilities that no single trader or system can provide alone - in effect, national digital infrastructure for trade. There is a trap to avoid here, and the paper names it rather than falls into it: if one argues that everything must exist first - every identifier, register, verification service, trust framework and legal change - one has written a justification for a decade of delay. The stronger approach is to identify the few high-leverage building blocks that unlock the most value.

14.1 The likely high-leverage building blocks

- **Reliable identification** of products, parties and locations - the precondition for linking and reusing anything.
- **Verified party identity** anchored to an authoritative business register - arguably the single highest-leverage block, because it tackles piggybacking directly. In Australia this points to a verifiable ABN ("vABN") the ATO/ABR would issue: a sovereign credential a counterparty can check in seconds, valuable far beyond trade, with broker, platform and private schemes (including the LEI/vLEI) complementary only.
- **A way to check evidence** - confirming a certificate or authorisation without a central database holding everything (which would itself be a privacy and security liability).
- **Legal recognition** of electronic and verifiable evidence under the Customs Act 1901 and Biosecurity Act 2015 - without which the rest cannot be relied upon at the border.

¹¹New Zealand Customs Service, Trade Single Window; WTO Trade Facilitation Agreement, Article 7; WCO SAFE Framework of Standards (2021).

¹²Singapore Customs, Networked Trade Platform; European Commission, EU Customs Reform / EU Customs Data Hub; Council of the EU (February 2026).

Australia already holds important pieces - authoritative registers, the Simplified Trade System's whole-of-government coordination (with a \$137.7m commitment to modernising agricultural export and import systems), and emerging digital-trade initiatives.¹³ The open question is how these connect into coherent, governed national infrastructure, sequenced alongside the STS to avoid duplication and lock-in.

14.2 A staged transition, not a big bang

Australia's audit history, the CRST paper's 7–10 year estimate, and the EU's decade-plus phasing all point away from a big-bang replacement and toward staged change with coexistence and fallback. The sequencing below is offered for ABF and DAFF to test and adapt, not as a prescription.

Figure 9. A staged transition across three horizons, with coexistence and fallback throughout. New approaches run in parallel with current cargo reporting for selected streams, with clear fallback - managing inertia while protecting trade continuity. Pace and scope are for ABF and DAFF to determine.

Questions for government - infrastructure and transition

Which shared building blocks should be public goods rather than rebuilt in each system, and which is highest-leverage to fund first? What minimum legal recognition is required for electronic and verifiable evidence at the border? Which bounded streams - trusted-importer release, low-value e-commerce data, export-certificate reuse - are the best parallel pilots, and what fallback protects continuity?

15. Conclusion

The most useful reframing of this reform may be to ask not how to replace the ICS, but what cargo reporting looks like when the same information, created once and shared, no longer has to be reported again and again. That mind-shift aligns the FCRM and CRST agendas with "Tell Us Once", the Simplified Trade System and the national productivity and data agenda.

It is a question with real dependencies, and this paper has tried not to minimise them. The information government most wants is the information least reliably present in commercial systems. Proving who said something is not proving it is true. The model is strongest for established traders and weakest at the parcel scale where volume is growing. National infrastructure must be provided and governed, and legal recognition secured, before reliance. Biosecurity integrity must be preserved as a first-order constraint. And the international exemplars are best read as experiments to learn from, not designs to import.

None of these is a reason not to explore the direction. Each is a reason to explore it as a staged, evidence-generating transition - through bounded pilots, in parallel with the existing system, with independent validation of economic claims - rather than as a system-replacement project carrying an unexamined assumption that the data is already there for the taking. For the people who run cargo reporting today, the reassurance bears repeating: the ICS, the declarations, the roles and the regulatory powers all remain. What changes is how often the same information must be created and entered. The question this paper most wants on the table is the one it began with: when the same information has already been created and shared once, what must still be reported again?

¹³DAFF / DFAT, Simplified Trade System and "Simplifying Australia's trade system" (\$137.7m commitment; modernising agriculture export/import systems; Biosecurity 2030).

This paper frames questions, evidence and options. Several are best answered by operational stakeholders - brokers, forwarders, carriers, terminal operators, express carriers, platforms, importers and exporters - and by ABF and DAFF. The companion Operational Annex (Attachment A) provides four 'day in the life' case studies, an operational identifier reference, and the technical detail behind the plain-English summaries used here.

Attachment A

Operational Annex

Day-in-the-life case studies, an operational identifier reference, and the technical detail behind the plain-English main paper

Companion to the main explainer above. This annex is for readers who want to see the day-to-day process changes in detail, the identifiers involved, and how the technical building blocks map to cargo reporting.

Part A - A day in the life

These four case studies show the same working day before and after, for the four roles most affected. They are deliberately practical: what lands in your inbox, what you type, what you chase, what you sign. Each is illustrative and uses example identifiers of the kinds already used in cargo reporting. In every case the role's accountability and powers are unchanged - what changes is the re-keying and the timing.

A1. A customs broker

Before and after - a customs broker. Process steps that involve professional judgement or legal accountability are unchanged; what changes is the re-keying and the timing around them.

Today, step by step

- Documents arrive by email - invoice, packing list, bill of lading - often as PDFs or scans.
- You re-key product, value and origin into the import declaration (for example N10-1234567).
- You classify and value the goods and determine origin - your professional judgement.
- You verify the client's identity as best you can - usually a manual ABN look-up that confirms the number exists, not that the person using it is authorised.
- You chase missing or inconsistent data by phone and email with the forwarder and importer.
- You lodge the N10, then monitor status, fixing mismatches as the cascade completes.

In a data-rich model

- The same invoice arrives as structured, identified data - not a PDF to retype.
- Your declaration is pre-populated from the source data for your review - you correct, you don't re-type.
- You classify and value the goods - now with AI assistance: identifier-to-classifier models suggest a tariff code from the product identity, and you confirm or correct it. The judgement, and the accountability, stay yours.
- You confirm the client is genuinely who they claim to be in seconds - a verifiable business identity (a vABN the ATO/ABR would issue) lets you check, not just trust, before you act on their behalf. This protects you, not only the regulator, from acting for a bad actor who has borrowed a legitimate ABN.

- Fewer chases: missing items are visible early against the shared shipment record.
- You lodge and sign the N10. Your accountability is identical; the re-keying and error risk are lower.

What does not change for this role

You remain accountable for classification, valuation, origin and the declaration - AI may suggest a code, but you decide and you sign. Nothing in this model moves that responsibility, or shifts liability onto you for data others created. What it adds is a way to verify, rather than assume, that the client you are acting for is genuine.

Evidence: Declaration and cargo reporting mechanics per ABF ICS manuals; reform directions per the ABF Future Cargo Reporting Model (FCRM) project (abf.gov.au). Verifiable business identity (vABN) is a future-state direction being tested in an industry-led sandbox supported by IFCBAA, ACITI and ECA. The broker's accountability for the declaration is unchanged.

A2. A freight forwarder

Before and after - a freight forwarder. Process steps that involve professional judgement or legal accountability are unchanged; what changes is the re-keying and the timing around them.

Today, step by step

- You collect data from many shippers in many formats and of varying quality.
- You build the consolidation and house bills, re-entering consignor, consignee and routing.
- You take on new customers and counterparties largely on trust, with little reliable way to confirm they are who they say they are.
- You report to the ICS in sequence - cargo cannot clear until higher levels are reported.
- You reconcile outturn discrepancies (surplus, short-landed) largely by hand.
- You answer regulator queries by re-supplying data you have already sent.

In a data-rich model

- Each shipment arrives carrying its own identifiers, so shipments are unambiguous from the start.
- You add only what you create - consolidation and house bill - once, by reference.
- You confirm a counterparty's identity before acting - a verifiable business identity (vABN) lets you check that a new customer or agent is genuine in seconds, reducing the risk of being used to move someone else's goods under a borrowed identity.
- You contribute to a shared record as events occur, rather than waiting your turn in the cascade.
- Outturn links automatically; discrepancies surface against the shared record.
- Fewer re-supply requests - regulators reuse what was already shared.

What does not change for this role

You keep your role consolidating and reporting your part of the chain. You are not asked to give open access to your systems - only to share defined, identified data elements you already hold. Verifying a counterparty protects your own business as much as the regulator's interest.

Evidence: Cascade reporting, outturns and consignment linkage per the ABF Import Cargo Reporting Manual; alternatives to cascade reporting are among the ideas published by the ABF Future Cargo Reporting Model (FCRM) project (abf.gov.au).

A3. An ABF risk officer

Before and after - an ABF risk officer. Process steps that involve professional judgement or legal accountability are unchanged; what changes is the re-keying and the timing around them.

Today, step by step

- You often wait for the cascade to complete before a full picture is available.
- You work with free-text goods descriptions that are inconsistent and hard to target.
- You verify identity manually - register look-ups - with piggybacking a known risk.
- You assess revenue and community-protection risk with value and origin largely taken on trust.
- You intervene relatively broadly, because targeting is less precise.

In a data-rich model

- You see data as events occur - earlier risk awareness, separate from final clearance.
- You work with structured identifiers - commodity, party and origin coded and linked.
- You can confirm verified party identity, making it harder to misuse a legitimate ABN.
- You target on better evidence - value and origin are still scrutinised, not assumed true.
- You intervene more precisely - more facilitation for low-risk, sharper focus on high-risk.

What does not change for this role

Your legal powers to question, hold, examine, seize and penalise are unchanged. Early data supports risk awareness; it does not replace the final declaration or your decision to act.

Evidence: Earlier-risk versus final-clearance separation ("separate release and clearance", "decouple revenue collection from clearance") are among the reform ideas published by the ABF Future Cargo Reporting Model (FCRM) project (abf.gov.au).

A4. A DAFF officer

Before and after - a DAFF officer. Process steps that involve professional judgement or legal accountability are unchanged; what changes is the re-keying and the timing around them.

Today, step by step

- You receive SAC or declaration data that is often thin at parcel scale.
- You request supporting documents; certificates arrive as paper or PDFs and are slow to check.
- You assess biosecurity risk from free-text commodity descriptions.
- You apply hold or release through the ICS - signalling you rely on.
- You issue export certificates manually, re-keyed for each market.

In a data-rich model

- You receive structured commodity and origin data, linked to the consignment.
- You can verify treatment and test certificates at source rather than chasing paper.
- You target earlier and better - richer data than free-text, even at parcel scale.
- You apply hold or release - signalling preserved, and made more reliable, not less.
- You reuse trusted export evidence, building on eCert - harder to forge, easier to verify.

What does not change for this role

Your biosecurity powers, inspections and conditions are unchanged, and hold/release integrity is treated as a first-order design constraint. The biosecurity-relevant data elements are for DAFF to specify.

Evidence: Hold/release integrity is a first-order constraint throughout the main paper. eCert and the Simplified Trade System per DFAT guidance.

Part B - Operational identifier reference

A data-rich model depends on using identifiers that already exist, consistently. The point of this reference is to show that the model is not tied to any one standards organisation - these identifiers are in everyday use across cargo reporting today. The examples are illustrative formats, not real records.

Identifier	Example	What it identifies	Where it is used today
Container number	MSCU1234567	One shipping container	Cargo reports, outturns, underbond movements
Ocean bill of lading	OOLU123456789	A sea consignment / contract of carriage	Sea cargo reports, house/ocean bill linkage
Voyage	MAERSK VOYAGE 123A	A specific vessel voyage	The key matching field across the cargo reporting chain
Master / house air waybill	MAWB + HAWB	An air consignment and its sub-consignments	Air cargo reports; cascade linkage
Flight number	(carrier flight)	The conveyance carrying air cargo	Air cargo reporting and arrival
ABN	12 345 678 901	An Australian business / importer	Declarations; party identity; piggybacking risk
Import declaration	N10-1234567	A full import declaration	Clearance of goods above A\$1,000
VIN	JT2BF22K7W0123456	One specific vehicle	Vehicle imports; compliance; registration
Property Identification Code (PIC)	(state-issued PIC)	A rural property / premises	Biosecurity traceability for produce and livestock
Commodity code	(tariff/commodity)	A class of goods	Classification; biosecurity targeting

Identifier	Example	What it identifies	Where it is used today
E-commerce set	platform + parcel ID + seller ID + importer	A parcel and the parties behind it	Low-value e-commerce risk and reporting

The point of this reference

Every identifier above is already in use. A data-rich model asks that they be used consistently, linked reliably, and - where it adds assurance - backed by checkable evidence. It does not require adopting any particular provider's scheme; the voyage number, the VIN and the PIC are not anyone's proprietary product.

Evidence: Sources for current usage: ABF Import Cargo Reporting Manual and ICS User Data Dictionary (container, bill, voyage, air waybill, ABN, N10); state primary-industry agencies (PIC); DAFF biosecurity guidance (commodity, PIC). Voyage number as the non-amendable matching key per ABF Cargo Reporting FAQs.

Part C - The technical building blocks, explained

The main paper deliberately avoids technical terms. This part is for readers who want them. It explains, in order, the ideas behind a data-rich model and - importantly - what each one does and does not prove. None of this is required reading to understand the direction.

C1. Giving information a clear label (identifiers and linked data)

A persistent identifier is a stable, globally-unique label for a thing - a product, a party, a location, a container. "Linked data" simply means that, given an identifier, a permitted party can find the information associated with it, and follow links to related information, without a single central database holding everything. In trade terms: from a container or consignment identifier you can discover the parties, the goods and the events connected to it.

Why it matters operationally: this is what lets a fact be stated once and reused by reference. Without reliable identifiers, reuse is guesswork and matching fails - which is exactly why the voyage number is already a non-amendable matching key in the ICS today.

C2. Evidence you can check (verifiable credentials)

A verifiable credential is a piece of information with a tamper-evident electronic signature, issued by an identified party. Anyone receiving it can check three things automatically: who issued it, that it has not been altered, and whether it has been revoked. A certificate of origin, a treatment certificate or an authorisation can be issued this way, so it can be checked rather than merely trusted.

The limit - stated here as plainly as in the main paper

A verifiable credential proves provenance and integrity - who said it, and that it was not changed. It does not prove the underlying claim is true. A verified invoice can still carry a false value. This is why verification supports, but never replaces, regulatory scrutiny and professional judgement.

C3. How the pieces connect (the ‘trust graph’ and the UN Transparency Protocol)

When identifiers and verifiable credentials are combined, the result is sometimes called a “trust graph”: a web of checkable links - this certificate is about this product, which is in this consignment, brought by this trader, from this property. The UN Transparency Protocol (UNECE Recommendation No. 49) is one emerging international expression of this pattern for trade, carrying product passports, conformity credentials and traceability events as verifiable credentials, anchored to authoritative registers.

How verifiable evidence links into a consignment. Evidence issued at source (left) links to the entities a regulator cares about (right). The regulator checks the links rather than re-collecting the data - but classification, valuation and origin remain determinations made by accountable parties.

These standards are named here for completeness and to show the direction is internationally grounded. The main paper’s argument does not depend on any one of them being adopted; the transferable ideas are stating information once, identifying it reliably, and making evidence checkable.

C4. What this does and does not prove - a summary

The building block	What it does prove	What it does NOT prove
Persistent identifier	That contributions refer to the same thing.	Anything about the thing’s value, classification or treatment.
Linked data	That related information can be discovered and connected.	That the connected information is correct.
Verifiable credential	Who issued a claim, and that it is unaltered and current.	That the claim is true.
Trust graph / UNTP	That a web of claims is internally consistent and checkable.	That the real-world facts behind the claims are accurate.

Why the annex ends here

The recurring message of the main paper and this annex is the same: these building blocks make reuse, linkage and checking possible, and they are genuinely valuable for that. But they are inputs to regulatory decisions, not substitutes for them. Classification, valuation, origin and biosecurity treatment remain determinations for accountable parties - brokers, importers, ABF and DAFF. That is what keeps a data-rich model credible.