# TradeLens Data Sharing Specification:

## Data Sharing Model

### March 2020

# Table of contents

# 1  Introduction

Data sharing is at the heart of the TradeLens platform. As cargo flows from source to destination across the supply chain, TradeLens participants involved in the transport and logistics of that cargo provide data to the platform, such as logistics milestones, movement information, and trade documents. The TradeLens platform, through a robust authorization and permission model, enables or restricts access to that data by other participants. The model both promotes secure and fast access to supply chain information and ensures that no commercially sensitive information is available to competitors or other unauthorized parties.
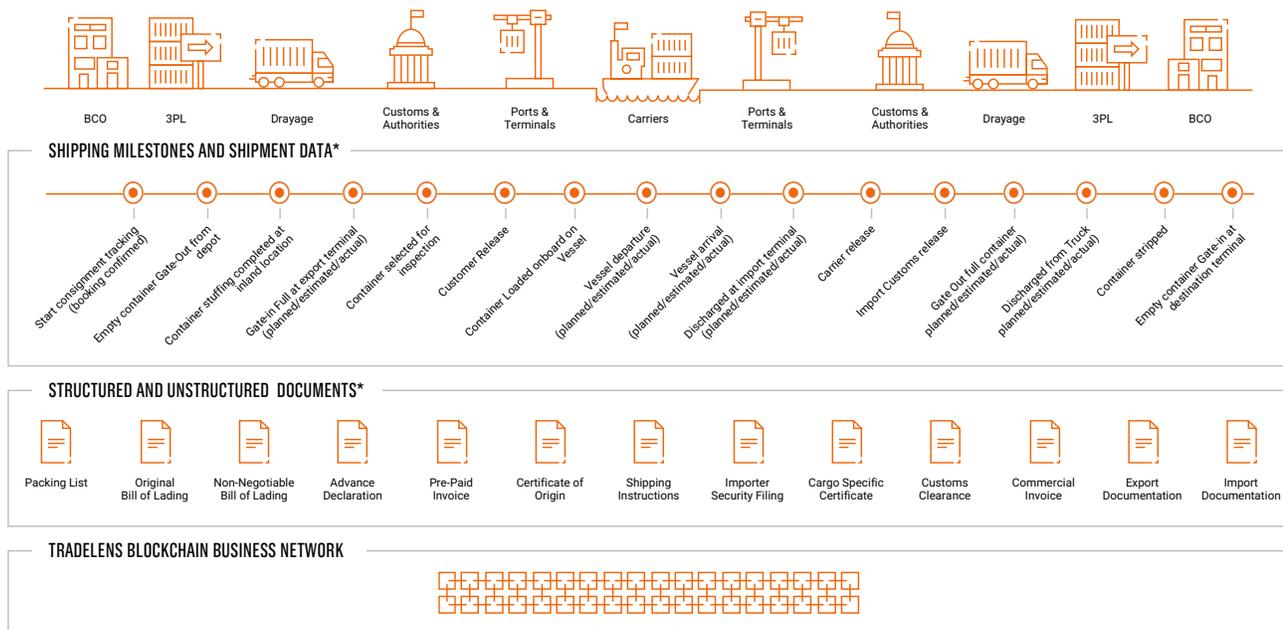


*Figure 1: Data sharing concept*

The TradeLens Data Sharing Specification (DSS) defines the rules governing TradeLens data sharing. The DSS is composed of:

1. This DSS *Data Sharing Model*, which lays out the key data sharing principles, identifies the participants and roles, describes the data model and data exchanged on the platform, and describes the data sharing rules, including special rules not directly applicable to an individual data item.

2. The DSS *Sharing Sheets*, maintained in a spreadsheet format (Microsoft Excel), which map the individual data items to the roles that have obligations to provide that data or rights to access that data.

# 2  Data Sharing Principles

Several key principles guide the model:

- ⦿ No data is made available to any party unless the party is a TradeLens participant[1], meaning they are customers or network members who are known, have agreed to the TradeLens terms and conditions, and have been onboarded.

- ⦿ TradeLens only provides access to the data associated with a specific shipment / consignment (see definitions below) to other participants that are involved in that shipment / consignment. For example, while an ocean carrier would have access to the data for containers it operates, other ocean carriers would not have access to that data. A cargo owner would have access to data for its shipments but no access to shipment data of other cargo owners.

---

[1] Includes prospective participants for purposes of sales demonstrations or limited trials only, or otherwise have access as involved governmental / regulatory authorities

- ◉ Data is made available to a participant according to the <u>role</u> that participant performs in a given shipment / consignment.

- ◉ Non-sensitive data (under the category Events) that today are generally accessible are made widely available to the other participants if they are involved in that shipment / consignment.

- ◉ More sensitive data (under the category Trade Documents) have stricter access rights across the participants involved in the shipment / consignment.

- ◉ The data sharing model recognizes the various commercial and logistics relationships common today, notably that shipments often comprise multiple consignments contracted to separate parties, and those consignments themselves are often subcontracted to other parties. For example, when a freight forwarder moves cargo for the shipper on a house bill of lading and subcontracts ocean carriage, the house bill of lading (and the sensitive data contained therein) is not visible to the ocean carrier, and the ocean bill of lading (and the freight data it may contain) is not visible to the shipper.

- ◉ Any reporting on aggregated or summarized data will not disclose the identities of individual TradeLens participants, unless the recipient of the information is already authorized to see the underlying data.

These principles guide the underlying data sharing model. The specific rules around data sharing are provided in Section 5 and the DSS Sharing Sheets.

# 3   TradeLens Participants

TradeLens *participants* are the shippers, ocean carriers, terminal operators, 3PL providers, inland transportation providers, government authorities, and other supply chain stakeholders who may provide and/or exchange information with the TradeLens platform. A participant joins the platform as a specific Participant Type.

Participant Roles are applicable to individual shipments or consignments (see definitions below) and relate to the function the participant performs in that shipment or consignment, such as transporting the cargo or performing customs brokerage services at import.

The table below lists the supported Participant Types and Roles. The definitions are provided in the corresponding tables under Types & Roles in the DSS Sharing Sheets.

| Participant Types | Participant Roles |
|---|---|
| Cargo Interest, 3PL Agent, State Agent, Ocean Carrier, TSI / NVOCC, Rail Operator, Truck Operator, Barge Operator, Feeder Operator, Terminal Operator, Depot Operator, Data Aggregator, Customs Authority, Port Authority, Financial Institution | Seller, Buyer, Exporter, Importer, Transport Service Buyer, Consignor, Consignee, Origin 3PL Agent, Destination 3PL Agent, Export Customs Broker, Import Customs Broker, Request Party, Notify Party, Transport Service Provider, Origin Marine Terminal, Destination Marine Terminal, Trans-shipment Terminal, Origin Inland Terminal, Destination Inland Terminal, Depot, PCS, Inland Aggregator, Export Authority, Import Authority, Buyer's Bank, Seller's Bank, Insurance Provider |

*Table 1: TradeLens Participant Types and Roles*

Participants may perform multiple roles. For example, an ocean carrier generally acts as a Transport Service Provider, but it may also be the Transport Service Buyer and Consignor in cases where it subcontracts an inland leg. A government authority acts as an Export Customs Authority for outbound goods and an Import Customs Authority for inbound goods. A cargo interest can be a Consignor, Consignee, Buyer, Seller, or a combination of these roles, depending on the shipment and terms of sale.

# 4   TradeLens Data

## 4.1   TradeLens Object Model

In describing the data sharing model, it is first important to understand how data are organized in the platform – in effect, the high-level object model that supports the multitude of commercial arrangements and logistics scenarios prevalent in the industry.

The TradeLens platform manages the sharing of data associated with three interrelated Trade Objects as defined by the UN-CEFACT Supply Chain Reference Data Model standard: shipments, consignments, and transport equipment.

| Trade Object | Definition |
|---|---|
| Shipment | A separately identifiable collection of goods (available to be) transported together from a seller to a buyer, including the shipping arrangements and movement of products including despatch and delivery, regardless of the modes of transport or the contracting / subcontracting relationships. |
| Consignment | A separately identifiable collection of goods transported together from one consignor to one consignee via one or more modes of transport as specified in one single transport contract. |
| Transport Equipment | Relates to the physical equipment used to hold, protect, or secure cargo for logistics purposes. Currently, containers are supported as transport equipment in TradeLens. Since some types of transport equipment are re-used, transport equipment in TradeLens is further constrained to an instance of the usage of a piece of equipment within the context of a shipment or a set of consignments relating to the end-to-end transportation of a shipment. |

*Table 2: TradeLens Trade Objects*

Participants involved in a shipment are generally the commercial parties and their agents involved in a trade, while participants involved in a consignment and transport equipment are both the commercial parties and transportation and logistics parties involved in the movement of goods from source to destination. The roles that a specific Participant Type can perform related to shipments, consignments, and transport equipment are provided in the Participant Types and Roles tables under Types & Roles in the DSS Sharing Sheets.

## 4.2 Trade Object Relationships

Because TradeLens is intended to support a wide variety of commercial arrangements among trading partners, the relationships across the potentially multiple consignments associated with a shipment are varied:

- Hierarchical relationships (i.e., parent-child) between consignments are enabled to support subcontracting of transportation legs. For example, a seller engages an ocean carrier to move goods from door to door, and the ocean carrier subcontracts inland carriage to a local truck operator. The consignment associated with the transport contract with the ocean carrier is a "parent" to the consignment associated with the transport contract for the truck carriage. The parties to those consignments, and the roles they play, will be different.

- "Sibling" consignments also occur. For example, the seller engages an ocean carrier to move goods to the import terminal, and the buyer engages a local trucking firm to move the cargo inland.

- In these scenarios, the same piece of transport equipment (container) can be related to both parent and child consignments, as well as both sibling consignments.

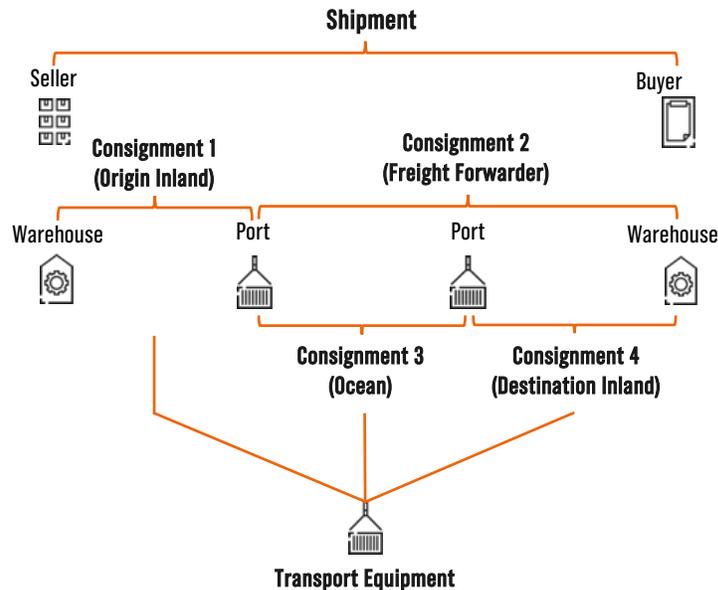An example of a multi-consignment shipment is provided below.

*Figure 2: Example Hierarchy*

In this example:

◉ Consignments 1 and 2 are sibling consignments because the buyer and/or seller have separately contracted an inland leg to transport the cargo from the warehouse to the port of origin, and a second leg to a freight forwarder to transport the cargo from the port of origin to the warehouse.

◉ Consignments 3 and 4 are child consignments to Consignment 2, because the freight forwarder has subcontracted separately the ocean transport to an ocean carrier and destination inland leg to an inland haulier (e.g., rail).

◉ All consignments are associated with the same single container.

In general, the relationships across Trade Objects are summarized below:

1. A consignment may exist without a shipment. In fact, this is the most common scenario in TradeLens today, as participating ocean carriers create consignments for all cargo they carry. Shipments are only created if a commercial party who is a TradeLens participant explicitly does so.

2. A shipment may be a parent of multiple consignments, meaning that the buyer, seller, or their agents may have contracted multiple providers for the end-to-end transport of the goods.

3. A shipment cannot be the parent or child of other shipments.

4. A consignment may be a parent of multiple consignments. As shown in the example above, this scenario could occur when a freight forwarder subcontracts the ocean leg and the inland haulage to separate transportation providers.

5. A consignment may be a child of multiple shipments, for example if the same seller is consolidating shipments of two different buyers into a single container for the ocean leg, but then deconsolidating at destination.

6. A consignment may be a child of multiple consignments, for example if a freight forwarder is consolidating multiple LCL consignments into a single ocean container.

7. Transport equipment may be associated with multiple sequential consignments in the course of a shipment (e.g., origin inland, ocean, destination inland), as well as with parent consignments in the hierarchy.

Various entities throughout the supply chain carry out selected parts of this model. TradeLens works by supporting individual vendor-client relationships, and links together instances of Trade Objects if and when they are available. A full, exhaustive hierarchy is supported but not mandatory.

## 4.3    Data Exchanged on the Platform

The data on the platform that is provided by participants and made available to participants falls into one of the data types in the table below. This data is associated with one or more of the object types above, based on its data type, meaning that data published to the platform will be assigned to the applicable Trade Object.

| Data Type | Definition | Applicable Trade Objects | Examples |
|---|---|---|---|
| Admin Event | An instructional request by an authorized party to set up, establish relationships, grant authorizations, and other administrative activities for a shipment, consignment, or transport equipment. | Shipment, Consignment, Transport Equipment | Start tracking a consignment; add a reference number |
| Planned Event | The planned events to be carried out to deliver the transport service and often align with pro-forma schedules. The Transport Service Provider is responsible for the plan and is the only party allowed to issue and change Planned Events. When a Transport Service Provider has subcontracted part of the consignment (e.g. truck or rail), it will have access to the plans and estimates for those subcontracted consignments (if provided by the subcontractor), and it is recommended that it updates the "parent" plans accordingly. | Consignment | Planned gate in; planned vessel arrival; plan rail departure |
| Estimated Event | Estimates of events about to happen related to a specific transport equipment. Any participant involved in executing a transport plan can issue Estimated Events related to its role in the transport. The difference between Planned and Estimated Events is noteworthy: a delay indicated by an Estimated Event may render a plan invalid but does not automatically update the plan. The Transport Service Provider should first react to the estimate, re-plan, and then issue set of new Planned Events, if appropriate. No new plan will be represented in TradeLens until that happens. | Transport Equipment | Estimated gate in; estimated vessel arrival; estimated rail departure |
| Actual Event | Occurrences of events that have been carried out and relate to a specific transport equipment. Any participant involved in executing a transport plan can issue Actual Events. Like Estimated Events, an Actual Event may indicate that the remainder of a transport plan is no longer valid, requiring the Transport Service Provider to re-plan and issue a new set of Planned Events. | Transport Equipment | Actual gate in; actual vessel arrival; actual rail departure |
| Other Event | Other transport and logistics events such as document-related events, customs-related events, and IoT data. Document-related events communicate an action (e.g., document submitted) on a specific document. | Shipment, Consignment, Transport Equipment | Customs release; VGM received |
| Trade Document | Documents, such as a bill of lading, which can be maintained in structured or unstructured form. The currently supported list of documents can be found at https://docs.tradelens.com/documents/document_sharing/. | Shipment, Consignment, Transport Equipment | Bill of Lading; DG Declaration; Import Declaration |

*Table 3: TradeLens Data Types*

It is important to note that an Event in TradeLens is not itself data, but instead is representative of a real-world occurrence of some activity (or plan or estimate thereof) or an instructional request by a participant. An Event encapsulates a set of associated underlying data, such as the time or location of the occurrence of the real-world activity. At a technical level, an Event has a corresponding implementation in the TradeLens platform event model.

The full list of Planned, Estimated, Actual, Admin, and Other Events, along with their definitions, are provided in the DSS Sharing Sheets. The TradeLens Swagger includes the details of the data attributes / fields including whether those fields are required versus optional. When providing data to the platform, participants must additionally meet these specifications in the Swagger.

The list of Trade Documents supported by the platform are provided in the DSS Sharing Sheets. The details of a Trade Document in structured form are found in the TradeLens Document Sharing Swagger.

The TradeLens Swagger is found at https://platform.tradelens.com/documentation/swagger/.

## 4.4    Initiation of Trade Object Instances

A consignment is created by a Transport Service Provider (the ocean carrier in most cases) at the time that it confirms a booking or work order. The Transport Service Provider then creates the associated transport equipment as soon as it is made aware of the Container ID(s) associated with the booking. This could occur, for example, when the ocean carrier is notified of an empty container gating out of a terminal / depot, when the container gates out full from the warehouse, or when it gates in full back at the terminal.

A shipment is created when a cargo interest (buyer, seller, importer, exporter) or their agents (origin or destination 3PL agent) explicitly initiates the shipment.

# 5   Data Sharing Rules

## 5.1    Data Sharing Within an Individual Shipment, Consignment, or Transport Equipment

Participants involved in a shipment, consignment, or transport equipment tracked on the platform have rights to access data, and may have obligations to provide data, based on the role that they play in that shipment, consignment, or transport equipment. For example, an ocean carrier as a Transport Service Provider has an obligation to provide the transport plan and amendments, and a terminal operator as an Origin Marine Terminal has an obligation to provide a gate-in for a container. Both have default rights to access the ETA data provided by the inland haulier.

The DSS Sharing Sheets lays out, in grid form:

⊙    Each individual data item tracked on the platform as rows in the grid

⊙    The roles various participants can play related to an instance of a shipment, consignment, or transport equipment, as columns in the grid

⊙    The obligations and rights that each role has related to each data item, by shipment, consignment, and transport equipment, within individual cells. The following codes are utilized to indicate the obligations and/or rights.

| Access Code | Meaning |
|---|---|
| M | Mandatory that the participant provide the data in all applicable scenarios. |
| C | Conditional for the participant to provide the data; if the data and scenario are relevant and applicable to the shipment / consignment / transport equipment, and if the data is available to the participant, then the participant must provide it. |
| O | Optional; the data can be published to the platform at the discretion of the participant. |
| R | The participant has rights to view / read (i.e., subscribe to) the data. |
| [blank] | The participant has no access to the data. |

*Table 4: Data sharing Access Codes*

## 5.2    How Roles are Assigned to an Instance of a Trade Object

Given that the role a participant takes dictates the obligations and access to data, it is important to describe how roles are assigned to participants within an individual consignment, shipment, or transport equipment. Roles are added either *implicitly* or *explicitly*.

### Implicitly assigned role

An implicitly assigned role is granted automatic access and doesn't require any party to take an explicit action.

⊙    The Transport Service Provider, by establishing a consignment, will always be automatically added as a role.

⊙    Marine Terminals and Customs Authorities will be granted implicit access to consignments passing through their jurisdictions, based on the transport plan of the consignment.

⊙    In the event that a transport plan changes, Marine Terminals and Customs Authorities will be re-determined based on the new transport plan, and access will be granted or removed as required.

### Explicitly assigned role

An explicitly assigned role will not be associated with the object until an authorized party to the object assigns that role.

- Consignment visibility can be explicitly granted by the Transport Service Provider or the Transport Service Buyer by means of the Consignment Visibility Added event, which specifies the organization to be granted access and the role to be granted within the consignment.

- The Transport Service Buyer will not have access to its consignments until the Transport Service Provider grants access, usually the ocean carrier at time of consignment creation. Likewise, no other party will have access until the Transport Service Provider or the Transport Service Buyer grants that access.

- A party may have its access revoked by the Transport Service Provider or Transport Service Buyer who added the party, and thereafter will not have access to the consignment.

- In the event that the Transport Service Buyer's access is revoked, access will also be revoked for all organizations to whom that Transport Service Buyer has provided consignment access rights.

## 5.3    Data Sharing Across Related Trade Objects

It is important to note that the DSS Sharing Sheets reflect obligations and rights of a single shipment, consignment, or transport equipment, and not those of related Trade Objects. Related Trade Objects are those involved in the same shipment (even if there is no explicit Shipment Object tracked on the platform). Since the parties to these related Trade Objects will be different in many cases, TradeLens has defined a set of rules regarding the sharing of data across parties to the related Trade Objects.

The table below defines the sharing rules in place across related Trade Objects.

| Trade Object to which Data is Published | Data Type of Published Data | Default Permissions of Parties to Related Trade Objects |
|---|---|---|
| Shipment | Admin Event | None. Only parties to the shipment have access. |
| | Other Event | None. Only parties to the shipment have access. |
| | Trade Document | None. Only parties to the shipment have access. |
| Consignment | Admin Event | Read access is granted to all parties to transport equipment directly associated with the consignment, subject to the restrictions under *Additional Data Sharing Rules*. In practice, this means that all parties to all consignments that share the same transport equipment have Read access to Admin Events across those consignments. |
| | Planned Events | None. Read access is granted only to the parties to the consignment, subject to the restrictions under *Additional Data Sharing Rules*. In practice, this means that Planned Events from a child consignment will not be visible to parties to the parent consignment (with the exception of the parties to the child consignment). |
| | Other Event | Read access is granted to all parties to transport equipment directly associated with the consignment, subject to the restrictions under *Additional Data Sharing Rul*. In practice, this means that all parties to all consignments that share the same transport equipment have Read access to Other Events across those consignments. |
| | Trade Document | None. Only parties to the consignment have access to Consignment Trade Documents. |
| Transport Equipment | Admin Event | Read access is granted to all parties to those consignments directly associated with the transport equipment, subject to the restrictions under *Additional Data Sharing Rul*. In practice, this means that all parties to all consignments that share the same transport equipment have Read access to Admin Events across those consignments. |
| | Estimated Event | Read access is granted to all parties to those consignments directly associated with the transport equipment, subject to the restrictions under *Additional Data Sharing Rul*. In practice, this means that all parties to all consignments that share the same transport equipment have Read access to Estimated Events across those consignments. |
| | Actual Event | Read access is granted to all parties to those consignments directly associated with the transport equipment, subject to the restrictions under *Additional Data Sharing Rul*. In practice, this means that all parties to all consignments that share the same transport equipment have Read access to Actual Events across those consignments. |
| | Other Event | Read access is granted to all parties to those consignments directly associated with the transport equipment, subject to the restrictions under *Additional Data Sharing Rul*. In practice, this means that all parties to all consignments that share the same transport equipment have Read access to Other Events across those consignments. |
| | Trade Document | None. Only parties to the transport equipment have access to the transport equipment Trade Documents. |

*Table 5: Data sharing rules across related Trade Objects*

In the example in Figure 2, there are parties to the shipment, parties to the four consignments, and parties to the one transport equipment. Based on the default sharing rules provided above:

⊙ No parties to the consignment or transport equipment will have access to shipment data, unless they are parties to the shipment as well.

⊙ Parties to any of the four consignments will not have access to the plans or trade documents of the other consignments, unless they are parties to those consignments as well.

⊙ All parties to all four consignments and the shipment have access to the estimated and actual events of the transport equipment, since the consignments all relate to the same container.

## 5.4  Additional Data Sharing Rules

A number of other rules data sharing rules are in place, that are not captured directly in the Data Sharing tables:

1. *Suppression of location information*. Street address-level location data will be suppressed, and UN/LOCODE and Terminal-level location only will be displayed, for all organizations with Read privileges except Cargo Interests, Authorities, Financial Institutions, and Ocean Carriers.

2. *Non-disclosure of a publisher's identity*. For any event published by a Cargo Interest, 3PL Agent, State Agent, Rail Operator, Truck Operator, Barge Operator, or Feeder Operator, the Originator Name field, Originator ID field, and the name of the Publishing Organization will be suppressed and replaced by the Publishing Organization Type for all organizations with Read privileges except Cargo Interests, Authorities, Financial Institutions, and Ocean Carriers.

## 5.5    Overriding Default Permissions

While the platform enforces the permissions in the DSS Sharing Sheets, the consignment defaults can be overridden by the Transport Service Buyer (defined as the buyer of transport services as stipulated in a transport service contract). A Transport Service Buyer can be the cargo interest, ocean carrier (when subcontracting one or more legs, often the inland transportation), or transport service intermediary (e.g., NVOCC).

# 6   Changes

The TradeLens Data Sharing Specification and the TradeLens Swagger are subject to change periodically, particularly around the release of a new version of the TradeLens platform. Participants are required to continue to meet their data provisioning obligations in compliance with the latest version of this Data Sharing Specification and TradeLens Swagger. Participants are encouraged to review the Data Sharing Specification and TradeLens Swagger regularly.