



The Global Language of Business

# GS1 Logistics Interoperability Model Application Standard

Created by the GS1 Logistics Transport & Logistics community, this document describes the Logistics Interoperability Model (LIM).

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# 1 Introduction

## 1.1 Purpose of this document

The purpose of this document is to describe the Logistics Interoperability Model (LIM). This document has been created by the GS1 Logistics Transport & Logistics community that consisted of Retailers, manufacturers, material suppliers, Logistics Service Providers and GS1 Member Organisations.

The mission of GS1 Logistics Transport & Logistics (T&L) is to lead the development and drive the implementation of the GS1 Logistics standards to gain business benefits for global supply chains by fostering interoperability between the partners to overcome barriers of scalability and achieve visibility.

## 1.2 Background

Logistics Service Providers play a significant role in today's supply chains in all industry sectors, by managing the internal and external flows of goods for Retailers, Hospitals, Pharmacies, Armed Forces, Manufacturers, Material suppliers and many more stakeholders. In many of these relationships, trading partners are faced with different business scenarios and data interchanges, especially when they move into more advanced interactions with Logistics Service Providers.

Thus, there is a need for common understanding of business processes, common communication and identification solutions, to overcome barriers of interoperability and scalability. These solutions will lead to more transparency of operations and visibility of the flow of goods and ultimately remove redundant excessive cost from the supply chain.

The foundation for the solution is a framework of common business processes supported by exchange of related information from master data alignment to financial settlement. The Logistics Interoperability Model – the LIM – provides such a framework. It constitutes the basis for further development.

The aim of the Logistics Interoperability Model (LIM) is to establish business interoperability in the in-land transport and warehousing business processes.



**Note:** The LIM covers business to business scenarios and processes. Business to Consumer interactions are not in scope of this document.

The LIM covers the following business functions:

- Procurement
- Planning
- Warehousing
- Transport
- Financial settlement

This document outlines several warehouse and transport scenarios, as well as the way the LIM can support them in practice.

Other logistics processes currently present on the marketplace are out of scope and may be described at the next stage of the LIM development (LIM 2.0).

## 1.3 GS1 standards – key enabler for interoperability

### GS1 system of standards

The GS1 system of standards provides a comprehensive set of standards to identify, capture and share information about objects throughout their lifecycle, providing the core foundation for interoperability:

1. Supply chain partners **identify** business objects and locations using standardised identifiers.



The GS1 standards help improve efficiency of operations and internal supply chain management, and offer compliance with the demands of the trading partners and requirements of legal regulations.

GS1 develops international and multi sectorial standards and helps to overcome barriers of international commerce created by national and industry specific practices. In defining the business processes, transactions and standards GS1 aligns with UN/CEFACT methodology. This ensures further interoperability with trading partners active in other industries.

## 1.4 Problem statement and opportunity

In current supply chains, many trading partners and other stakeholders are confronted with different business processes and data interchange scenarios with their Logistics Service Providers. This becomes even more apparent when they move into more advanced interactions, in which the Logistics Service Providers play more and more significant role. Different business processes and approaches create a barrier to the scalability and visibility, adding many extra costs and efforts to the daily operation.

Parties will benefit from more interoperable systems and scalable solutions that make operations more efficient and transparent and bring visibility of the goods flow. This is achieved through enhanced business interoperability.

Business interoperability is the capability to run business processes seamlessly across organisational boundaries. Interoperability is achieved by understanding how business processes of different organisations can interconnect using the standards to efficiently support these business processes and by specifying the messages exchanged between the organisations.

## 1.5 Scope

The scope of the LIM covers Transport and Warehouse management and includes activities associated with the movement of goods from the material supplier to the manufacturer to the retailer using logistics service providers, incorporating the return of goods (reverse logistics). The terminology used below is most common to the Consumer Packaged Goods (CPG) supply chain. However the logistics models and scenarios described below are in effect independent of the type of Goods being handled.

The LIM describes common business processes and data interchanges to support interoperability with Logistics Service Providers.

The following statements will further clarify the scope of the LIM:

- Focus is on continental transport modes (road, rail, inland water, short sea). For road transport, this includes Full Truck Load (FTL) transport, Less Than Truck Load (LTL) transport and Parcel distribution.
- Value added services like dry filling, repacking for promotions, re-stacking or re-labelling are also included. As long as the GTIN of serviced item stays the same it is considered a value added logistics service (in scope), if the GTIN changes it is considered contract manufacturing (out of scope).
- Load tendering within the frame of a contract is also included. Strategic tendering (to negotiate new contracts) and load tendering on spot market are out of scope.

The LIM covers the following business functions:

- Procurement
- Planning
- Warehousing
- Transport
- Financial settlement



**Note:** there are no indications on what information flows are mandatory or optional in this document. This is being decided on an implementation level.



## 2 Logistics Interoperability Model (LIM)

### 2.1 Basic considerations

### 2.2 LIM processes and EDI messages

The LIM is composed of business processes or business process blocks, divided into business transactions, these business transactions have been mapped to electronic messages (GS1 EDI). Relationship between transactions and messages is not by default 1 to 1. Several transactions have been mapped to one message.

The model consists of seven distinct business processes:

Interoperation agreement	Master data alignment	Logistics service conditions	Planning	Warehousing	Transport	Financial settlement
--------------------------	-----------------------	------------------------------	----------	-------------	-----------	----------------------

### 2.3 Basic terminology

Throughout the model, specific terms are used to depict the types of trading partners and the roles they play.

#### Parties

The following generic terms are used to refer to parties:

- Retailer
- Manufacturer
- Material supplier
- Logistics Service Provider (Warehousing and/or Transport)

#### Roles

These parties can play one or more of the following **roles** in the business processes:

- Logistics Service Provider (LSP)
- Logistics Service Buyer (LSB)

These two roles represent the primary parties involved in the commercial transaction of buying logistics services.

- Consignor
- Consignee

These two roles represent the primary parties in the commercial transaction of trading goods.

#### Locations

A party will have multiple physical locations, such as warehouses, distribution centres and stores. Generic location names are used to further detail the physical locations of the parties in relation to the relevant business process:

- Inventory Location
- Ship From Location
- Ship to Location
- Pick-up Location
- Drop-off Location

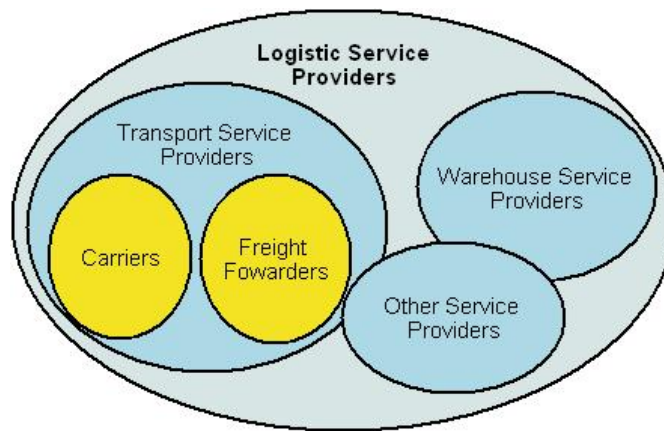
### Logistics Service Providers

There are various terms to refer to types of Logistics Service Providers (LSP):

- Transport service providers
- Carriers
- Freight Forwarders
- Warehouse service providers
- Other service providers such as Customs Brokers.

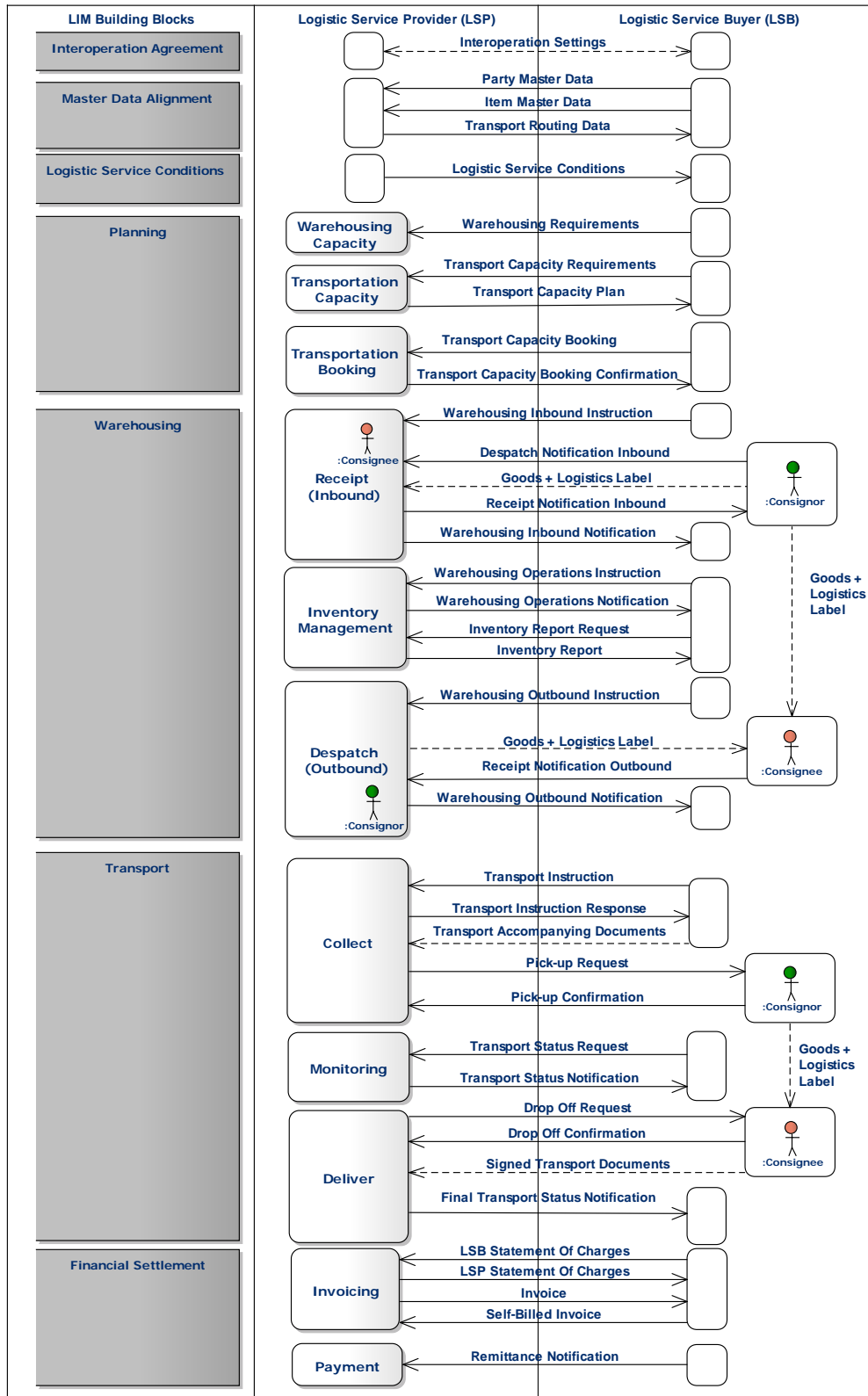
The diagram below illustrates how these terms relate to each other.

**Figure 2-1** Types of LSP's



## 2.4 LIM Overview

Figure 2-2 LIM



### 3 LIM Building blocks

#### 3.1 Interoperation agreement

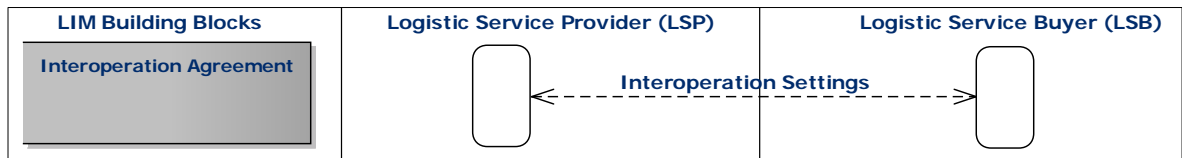
##### 3.1.1 Scope

Interoperation agreement	Master data alignment	Logistics service conditions	Planning	Warehousing	Transport	Financial settlement
--------------------------	-----------------------	------------------------------	----------	-------------	-----------	----------------------

The "Interoperation agreement" represents the first of the LIM building blocks. Its scope is agreement on the operational and tactical elements between Logistics Service Provider and Buyer. It contains the following components for which the roles and responsibilities as well as parameters and targets have to be defined: master data alignment, warehouse and transport capacity management, service delivery, frequency of rate review, payment, claims, systems security, confidentiality/non-disclosure agreement, traceability requirements, service levels (and other performance measures), quality management and requirements and escalation procedures. It also defines the technical, administrative and computing methods by which integration between Logistics Service Provider and Buyer will occur, including standards used, performance expectations, back-up procedures and data privacy.

##### 3.1.2 Transactions

**Figure 3-1** Interoperation agreement



##### 3.1.3 Interoperation settings

**Purpose:** This transaction enables the exchange of the interoperation agreement, containing information on scenarios to be implemented and parameter settings (e.g., response times) to be applied between the trading partners.

**Trigger:** Logistics Service Provider and Logistics Service Buyer jointly carry out this transaction during initial implementation of the interoperation agreement, as well as when a change needs to be made to the existing interoperation agreement.

**Response:** Not foreseen

### 3.2 Master data alignment

##### 3.2.1 Scope

Interoperation agreement	Master data alignment	Logistics service conditions	Planning	Warehousing	Transport	Financial settlement
--------------------------	-----------------------	------------------------------	----------	-------------	-----------	----------------------

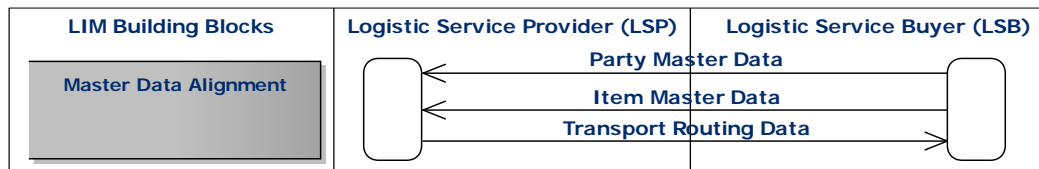
Master data alignment includes definition of the items, locations and routing codes used in the logistics execution to ensure that both parties have the same and unambiguous understanding of this basic supply chain information. One challenge facing all trading relationships is maintaining accuracy and distribution of base item, location and routing data given the rapid changes to specifications and logistics information that can arise. Therefore, on-going alignment and

synchronisation of the item, location and routing data is an essential element in ensuring interoperability.

In the future, it is envisaged that this will also be applied to service items.

### 3.2.2 Transactions

Figure 3-2 LIM Master data alignment



#### 3.2.2.1 Party master data

**Purpose:** The Party Master Data transaction enables the alignment and synchronisation of party related information between trading partners.

Party Master Data consists of generic data, such as names and addresses of parties and locations, and information specifically required for logistics, such as:

- time-windows allowed for Pick-up and Drop-off (these may be different on a single site),
- constraints regarding vehicles allowed for pick-up/delivery (inner city => vans/small trucks only), equipment requirements (e.g., tail-lift trucks or “kooiaap”),
- indicator for need to book slot for drop-off/pick-up,
- etc.

Each set of data can be uniquely identified by a Global Location Number (GLN). In this way, data covered in the Location Master Data does not need to be filled in other transactions.

**Trigger:** The Logistics Service Buyer will be responsible to maintain and communicate the party and location data of its trading partners to the Logistics Service Provider. The *Location Master Data* will be aligned each time information changes or new information is added.

**Response:** Not foreseen



**Note:** The Party Master Data may be made available in fully automated way, using [Global Data Synchronisation Network](#), where sellers can publish their data and buyers can subscribe to be automatically notified about any updates.

The bilateral exchange of master data directly between trading partners is currently not supported by the GS1 XML messages and needs to be performed by using other channels than EDI. Such a message may be developed at later stage, upon user request.<sup>1</sup>

GS1 EANCOM standard provides the Party Information (PARTIN) message for bilateral exchange.

#### 3.2.2.2 Item master data

**Purpose:** The Item Master Data transaction enables the alignment and synchronisation of item information between trading partners. Item Master Data is a set of data that describes the specifications and structures of each item involved in supply chain processes. Each set of data can be uniquely identified by a Global Trade Item Number (GTIN). This way data covered in the item master data does not need to be filled in other transactions.

**Responsible party:** In logistics service, scenarios the Item Master Data will be supplied by the Logistics Service Buyer. The *Item Master Data* will be aligned each time information changes or new information is added.

**Response:** Not foreseen

<sup>1</sup> For more information about submitting development request please refer to <http://wr.gs1.org/>

✔ **Note:** The Item Master Data may be made available in fully automated way, using [Global Data Synchronisation Network](#), where sellers can publish their data and buyers can subscribe to be automatically notified about any updates. This is the preferred and most efficient method, as GDSN supports accurate, real-time data sharing and trade item updates among subscribed trading partners. The bilateral exchange of master data directly between trading partners is supported by the GS1 XML message *Item Data Notification* or GS1 EANCOM Price/Sales Catalogue (PRICAT) message.

### 3.2.2.3 Transport routing data

**Purpose:** The Transport Routing Information enables the alignment and synchronisation of routing information between trading partners. The data contained in the message allow a shipper to produce shipping unit labels displaying correct routing and transit information and, if required, to load pre-positioned delivery vehicles in accordance with the carrier's or freight forwarder's routing plan.

**Trigger:** The Logistics Service Provider –freight forwarder or carrier – will send the transport routing information to the Logistics Service Buyer. *Transport Routing Data* will be aligned each time information changes or new information is added.

**Response:** Not foreseen

✔ **Note:** This information needs to be transferred using channels other than EDI.

## 3.3 Logistics service conditions

### 3.3.1 Scope

Interoperation agreement	Master data alignment	Logistics service conditions	Planning	Warehousing	Transport	Financial settlement
--------------------------	-----------------------	------------------------------	----------	-------------	-----------	----------------------

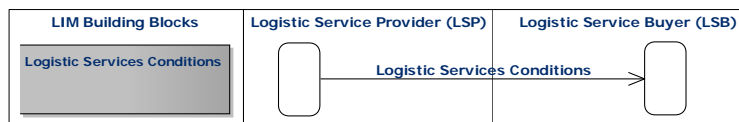
The Logistics service conditions describes the commitment between the logistics service Buyer and the logistics service provider on execution of the agreed service around warehousing, transport or both, for a given period and at the stated rate/price.

The Logistics service conditions define the relevant contractual data to be able to invoice the logistics services rendered. It does not intend to cover the totality of the contractual data.

✔ **Note:** These conditions can be included within Transport Instruction and Transport instruction response, but cannot be pre-aligned using EDI messages.

### 3.3.2 Transactions

**Figure 3-3** LIM Logistics service conditions



### 3.3.3 Logistics service conditions

**Purpose:** The *Logistics service conditions* transaction is typically used in the case where a general contract has been established between parties against which services will be ordered over a period on an order-by-order basis. The contract will have been previously negotiated and accepted. The aim of the transaction is to provide the contractual conditions of a previously negotiated contract to enable automatic order validation of and invoice verification prior to payment.

The *Logistics service conditions* include various factors that will determine the service tariffs. These may include:

- Postal-Code Area (PC-area from and PC-Area to); PC-area may cross country borders (transport from Venlo-NL to German destinations may be handled with German domestic tariffs)
- Load Unit type and/or Loading Metres
- Type of goods, e.g., Hazardous, Frozen/Chilled/Ambient
- Service Level, e.g., Expedited, Standard, Deferred

**Trigger:** Triggered by Logistics Service Provider on establishment of the contract

**Response:** Not foreseen

### 3.4 Planning

#### 3.4.1 Scope

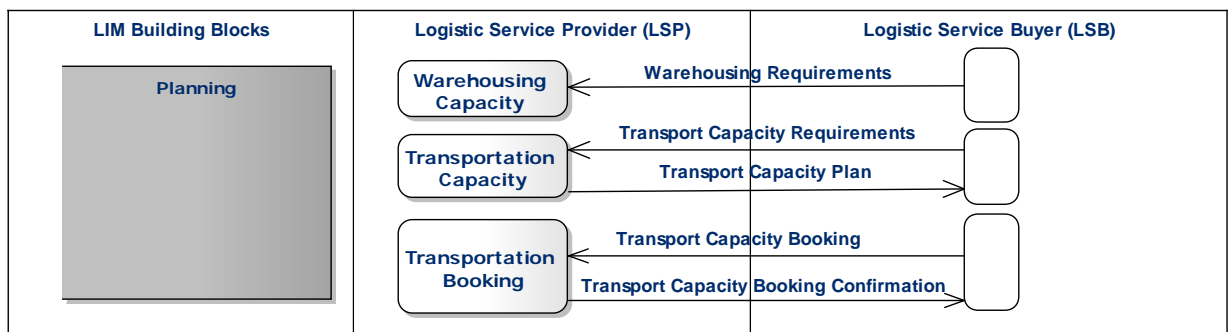
Interoperation agreement	Master data alignment	Logistics service conditions	Planning	Warehousing	Transport	Financial settlement
--------------------------	-----------------------	------------------------------	----------	-------------	-----------	----------------------

**Planning** focuses on future warehousing or transport activities and aims at ensuring capacity to fulfil requested services. For warehousing capacity, this applies to the storage volume and resource capacity. For transportation capacity, this applies to transport volumes and timings.

The capacity planning is driven by the monthly and/or weekly forecasted shipments/pallets/picking until the actual demand (shipment) is released to the warehouse and or transport provider via a delivery instruction (for transport booking, order picking, packing and loading). In some cases, actual planned shipments are available to increase forecast accuracy.

#### 3.4.2 Transactions

**Figure 3-4** LIM Planning



#### 3.4.3 Warehousing requirements

**Purpose:** The purpose of this transaction is to define and share warehouse planning information based on historical and forecasted demand data (by category and customer), event data and, in some business cases, actual planned shipments before they are released to the DC for processing. This and any other relevant data can be shared between the two parties in order to jointly plan warehousing capacity demand for the future.

*Warehousing Requirements* may include information that will enable the Logistics Service Provider to plan:

- No. of picking/pallet spots (warehouse capacity)

- No. of order pickers/fork lift drivers (people capacity)
- No. of in and outbound trucks (dock door capacity)
- Anticipated dates/period

**Trigger:** The Logistics Service Buyer will communicate the planning information monthly and/or weekly, until the actual demand (shipment) is released to the DC for order picking, packing and loading.

**Response:** Not foreseen

#### 3.4.4 Transport capacity requirements

**Purpose:** The purpose of this transaction is to define and share transportation planning information based on historical and forecasted demand data (by category and customer), event data and, in some business cases, actual planned shipments before they are released to the DC for processing. This and any other relevant data can be sent by the Logistics Service Buyer in order to plan transportation capacity demand for the future

*Transportation Capacity Requirements* may include information that will enable the Logistics Service Provider to plan:

- Type and No. of Transport
- Trade-lane (from/to location indicators)
- Available transport Logistics Service Providers
- Anticipated dates/period

**Trigger:** The Logistics Service Buyer will communicate the planning information monthly and/or weekly, until the actual demand (shipment) is released to the DC for transport booking.

**Response:** The Logistics Service Provider should confirm if the planned transport data can or cannot be used for the actual firm transport booking. It is done with the Transport Capacity Plan.

#### 3.4.5 Transport capacity plan

**Purpose:** To confirm whether the Logistics Service Provider has capacity to deliver all or part of the required transport services.

**Trigger:** After receipt of the *Transport Capacity Requirements*, the Logistics Service Provider will calculate whether the requirements can be fulfilled and will send a response.

**Response:** Not foreseen.

#### 3.4.6 Transport capacity booking

**Purpose:** The process of making a reservation for space on a means of transport for the movement of goods (for example, a number of containers on a vessel operated by an ocean carrier). To reserve space, the Logistics Service Buyer (LSB) and Logistic Service Provider (LSP) will exchange booking request and booking response messages.

**Trigger:** The capacity booking process begins with the Logistics Service Buyer sending a booking request to ask if there is the possibility to reserve space on a certain date and time to a certain destination. A capacity booking is typically for a single pickup date and a single delivery date from a single consignor to a single consignee.

**Response:** The LSP will send back a transport capacity booking confirmation message.

#### 3.4.7 Transport capacity booking confirmation

**Purpose:** The Logistics Service Provider receives and validates the booking data, verifies the transport requirements, and determines whether they can accept the booking or reservation based on space availability. The LSP will send back a response message either confirming the space



booking on the means of transport or indicating that they do not accept the space booking (and possibly supplies an option to the space booking).

**Trigger:** The capacity booking process begins with the Logistics Service Buyer sending a booking request to ask if there is the possibility to reserve space on a certain date and time to a certain destination. A capacity booking is typically for a single pickup date and a single delivery date from a single consignor to a single consignee.

**Response:** Not foreseen.

### 3.5 Warehousing

#### 3.5.1 Scope

Interoperation agreement	Master data alignment	Logistics service conditions	Planning	Warehousing	Transport	Financial settlement
--------------------------	-----------------------	------------------------------	----------	-------------	-----------	----------------------

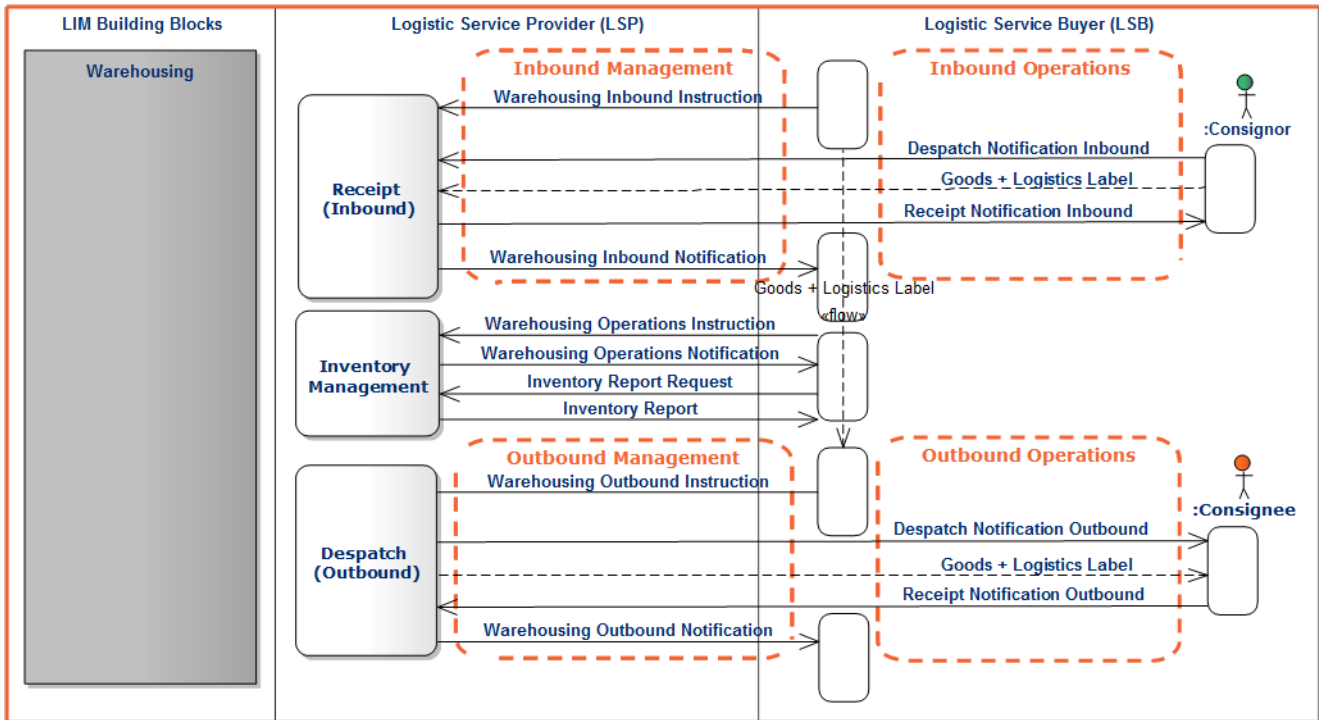
Warehousing is the receipt, storage, and preparation of products for customer delivery based on orders. It also includes all involved administrative activities. Within storage, this also covers the control of stocks including traceability in the warehouse.

The return flow of products and materials in the supply chain is also included, like product recalls and reverse logistics for empty pallets or crates.

On top of these warehousing activities, additional services may be rendered, like dry filling, repacking for promotions, re-stacking or re-labelling are also included. This is often defined as value added services. As long as the GTIN of serviced item stays the same, this is considered a value added logistics service (in scope). If the GTIN changes, this is considered contract manufacturing (out of scope).

#### 3.5.2 Modules

The Warehousing business transactions have been clustered in a number of coherent modules. Each module represents an interaction between two trading partners.

**Figure 3-5 LIM Warehousing Modules**


The transactions in the next paragraph have been clustered by module: [Inbound Management](#), [Inbound Operations](#), [Outbound Management](#), [Outbound Operations](#) and [Other Transactions](#).

### 3.5.3 Transactions for inbound management

#### 3.5.3.1 Warehousing inbound instruction

**Purpose:** Communicate anticipated receipts to the Logistics Service Provider. This will help the LSP to plan required capacity. The Warehousing Inbound Instruction is also used in case of reverse logistics for returns.

**Trigger:** Triggered by the Logistics Service Buyer after the goods have been ordered, and the Buyer received the order confirmation or despatch advice from the supplier of goods or an update (such as planned receipt) or cancellation.

**Response:** Warehousing inbound notification

#### 3.5.4 Warehousing inbound notification

**Purpose:** The purpose is for the Logistics Service Provider to inform the Logistics Service Buyer regarding the status of the inbound delivery. The transaction is used to communicate the actual receipt (including discrepancies – if any) versus the information in the *Warehousing Inbound Instruction*.

**Trigger:** Triggered by the Logistics Service Provider after he has received the goods. The message can also be used to cancel the Warehousing Inbound Instruction in case it is known that the goods will never be received.

**Response:** Response to Logistics Service Provider is not foreseen, however a Receiving Advice may be send to the supplier after processing the Warehousing Inbound Notification, to report the actual receipt.

### 3.5.5 Transactions for inbound operations

#### 3.5.5.1 Despatch notification inbound

**Purpose:** Generally, the *Despatch Notification* enables one Shipper (Consignor) to provide information about the content of a shipment to one Receiver (Consignee). Specifically the *Inbound Despatch Notification* serves to inform the Logistics Service Provider (Consignee) on shipments (including returns) despatched to him.



**Note:** The despatch notification message in GS1 EDI standards is called Despatch Advice DESADV in GS1 EANCOM).

**Trigger:** Triggered by the Consignor at shipment creation.

**Response:** Receipt Notification

#### 3.5.5.2 GS1 Logistics Label (inbound)

**Purpose:** Logistics units are items made up for transport and distribution purposes, and pallets are one particular example. Using the *GS1 Logistics Label* containing the Serial Shipping Container Code (SSCC) allows users to identify logistics units uniquely so that they can be tracked and traced throughout the supply chain.

**Trigger:** The consignee is responsible at the time of receiving the goods to register information from the logistics label, and to use it in the further communication, such as the *Receipt Notification*.

#### 3.5.5.3 Receipt notification inbound

**Purpose:** The purpose of the *Inbound Receipt Notification* is for the Logistics Service Provider to inform the shipper (Consignor) of actual goods received, compared to what was notified as being sent. Typical business uses of the receipt information can include updating of inventory, identifying shipping discrepancies and adjusting orders as well as related invoicing.



**Note:** The receiving notification message in GS1 EDI standards is called Receiving Advice RECADV in GS1 EANCOM).

**Trigger:** Triggered by the Logistics Service Provider (= Consignee) at receipt of the shipment.

**Response:** Not foreseen.

### 3.5.6 Transactions for outbound management

#### 3.5.6.1 Warehousing outbound instruction

**Purpose:** The purpose of the *Warehousing outbound instruction* is to order the picking and loading/load preparation of a specific shipment, and can include customer related value added services on products (e.g., unpack from various different packages, re-pack and label in another package). It does not cover the ordering of transport services.

The information may include:

- Carrier and Service to be used/destination (market, country, postal code area)
- Type of transport means to be used
- Type of packaging to be used
- Information to be printed on the shipping documents

**Trigger:** Triggered by the Logistics Service Buyer at the point of order release to the warehouse.

**Response:** No response is foreseen, only a general notification message that the business application has received the request.

### 3.5.6.2 Warehousing outbound notification

**Purpose:** the Logistics Service Provider informs the Logistics Service Buyer about the status of the outbound shipment. The notification can be used to communicate information such as used carrier, logistics units, track and trace information, as well as discrepancies between the actual Shipment and the information in the *Warehousing outbound instruction*. The Logistics Service Buyer is triggered by this message to start the follow up processes such as billing and sending a Despatch Advice to the customer.

**Trigger:** Triggered by the Logistics Service Provider after despatch of the goods.

**Response:** No response is foreseen.

## 3.5.7 Transactions for outbound operations

### 3.5.7.1 Despatch Notification Outbound

**Purpose:** Generally, the *Despatch Notification* enables one Shipper (Consignor) to provide information about the content of a shipment to one Receiver (Consignee). Specifically the *Outbound Despatch Notification* serves to inform the Consignee about shipments despatched to them.



**Note:** The despatch notification message in GS1 EDI standards is called Despatch Advice DESADV in GS1 EANCOM).

**Trigger:** Triggered by the Logistics Service Provider (Consignor) at shipment creation.

**Response:** Receiving Notification Outbound

### 3.5.7.2 GS1 Logistics Label (outbound)

**Purpose:**

Logistics units are items made up for transport and distribution purposes, and pallets are one particular example. Using the *GS1 Logistics Label* containing the Serial Shipping Container Code (SSCC) allows users to uniquely identify logistics units so that they can be tracked and traced throughout the supply chain.

**Trigger:** The consignor is responsible at the time of goods despatch to create and register information from the logistics label, and to use it in the further communication, such as the *Despatch Notification*.

The *GS1 Logistics Label* groups information into three logical sections for the supplier, customer and carrier.

Each label section may be applied at a different point in time, as relevant information becomes known:

1. The *supplier section* of the label contains information that is generally known at the time of packaging by the supplier.
2. The *customer section* of the label contains information that is generally known at the time of order and order processing by the supplier or logistics service provider.
3. The *carrier section* of the label contains information that is generally known at the time of shipment and is typically related to transport, see paragraph [GS1 Logistics Label \(Transport\)](#).

### 3.5.7.3 Receipt notification outbound

**Purpose:** The purpose of the *Outbound receipt notification* is for the Consignee to inform the Logistics Service Provider (Consignor) of actual goods received, compared to what was notified as being sent. Typical business uses of the receipt information can include – updating of inventory, identifying shipping discrepancies and adjusting orders as well as related invoicing.



**Note:** The receiving notification message in GS1 EDI standards is called Receiving Advice RECADV in GS1 EANCOM).

**Trigger:** Triggered by the Consignee at receipt of the shipment.

**Response:** No response is foreseen, only a general notification message that the business application has received the request.

### 3.5.8 Other transactions

#### 3.5.8.1 Warehousing operations instruction

**Purpose:** A Buyer can use an LSP to carry out non-customer related value added services on products (e.g., internal movements, re-packing, inspecting, destroying, assembling, etc.). The *Warehousing operations instruction* is used to order these services.

**Trigger:** Triggered by Logistics Service Buyer at order creation.

**Response:** Warehousing operations notification

#### 3.5.8.2 Warehousing operations notification

**Purpose:** The purpose of *Warehousing Operations Notification* inform their Logistics Service Buyer the status of inventory management operations that have been carried out.

**Trigger:** Triggered by Logistics Service Provider at the executing of requested services.

**Response:** No response is foreseen.

#### 3.5.8.3 Logistics inventory report request

**Purpose:** to request an inventory report from another party, using specific selection criteria.

**Trigger:** Triggered by the party that needs information about inventory an inventory status.

**Response:** Logistics Inventory Report

#### 3.5.8.4 Logistics inventory report

The inventory report consists of two parts: *Inventory Status* and *Inventory Event*.

These two parts can be used independently or combined:

- Only Inventory Status: to report the status of the stock position at the end of the reporting period.
- Only Inventory Event: to report an activity or activities done by the Logistics Service Provider to the Logistics Service Buyer in the reporting period.
- Combined Inventory Status and Inventory Events: All relevant activities done in the given timeframe and the resulting stock position at the end of the reporting period.

##### Inventory status

**Purpose:** Inventory status is used for reporting the actual stock position at a certain point in time (e.g., hour, week, day, month).

Inventory data can be exchanged based on the location and then item or on the item and then location– in case of the same item stored at more than one location.

**Trigger:** The transaction will be triggered by the Logistics Service Provider at the agreed upon date(s) and time(s) for sending or in response to an Inventory Report Request.

**Trigger:** The transaction will be triggered by the Logistics Service Provider at the agreed upon date(s) and time(s) for sending.

**Response:** No response is foreseen.

### Inventory events

**Purpose:** Inventory events are identified as adjustments of the inventory over a certain period (e.g., hour, week, day, month) or at a certain point in time (e.g., hour, week, day, month).

Inventory data can be exchanged based on the location and then item or on the item and then location – in case of the same item stored at more than one location.

**Trigger:** The transaction will be triggered by the Logistics Service Provider at the agreed upon date(s) and time(s) for sending, after a request from the Logistics Service Buyer or in case of an event that requires reporting to the Logistics Service Buyer as per agreement (e.g., goods were damaged in the warehouse). The activity is explained in the *InventoryEventReasonCode*.

**Response:** No response is foreseen

## 3.6 Transport

### 3.6.1 Scope

Interoperation agreement	Master data alignment	Logistics service conditions	Planning	Warehousing	Transport	Financial settlement
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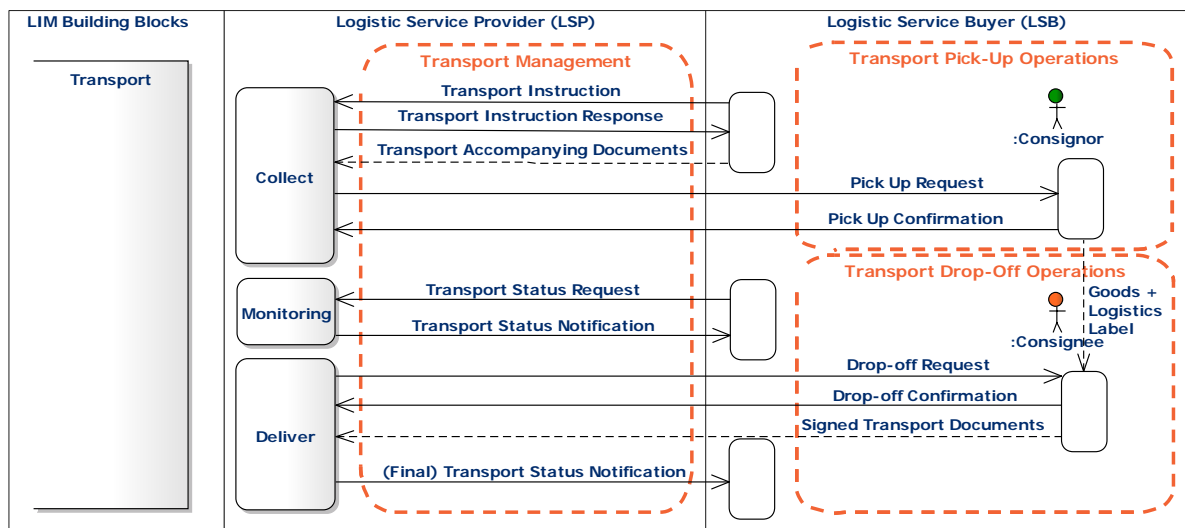
Transport is the movement of goods from factories to warehouses or depots (collection), the movement of goods from warehouses to the customer delivery locations (delivery) and the monitoring of these movements.

While the LIM model aims to be transport mode independent and it can be applied to road, rail, ocean and air, it is focused on continental transport modes. For road transport, this includes Full Truck Load (FTL) transport, Less Than Truck Load (LTL) transport and Parcel distribution.

### 3.6.2 Modules

The business transactions have been clustered in a number of coherent modules. Each module represents an interaction between two trading partners.

Figure 3-6 LIM Transport modules



The transactions in the next paragraph have been clustered by module: [Transport Execution](#), [Transport Pick-up Operations](#) and [Transport Drop-off Operations](#).

### 3.6.3 Transactions for transport management

#### 3.6.3.1 Transport instruction

**Purpose:** The main objectives are to communicate/ share the arrangement of the transport of goods between all parties involved in the movement of the consignment(s) as well as providing information necessary to perform that transport and delivery of the goods. The transaction can cater for one consignment or multiple consignments.

**Trigger:** The *Transport Instruction* will be sent by the Logistics Service Buyer (supplier, retailer, 3<sup>rd</sup> party warehouse or freight forwarder) to a Logistics Service Provider (freight forwarder or carrier) upon order creation.

**Response:** Transport instruction response

#### 3.6.3.2 Transport instruction response

**Purpose:** The main objectives are to give the confirmation or modification of the arrangement of the transport of goods between all parties.

**Trigger:** The Response will be sent by the Logistics Service Provider (freight forwarder or carrier) to the Logistics Service Buyer. The transaction will be triggered within the agreed time interval from receipt of the *Transport instruction*.

**Response:** Not foreseen

#### 3.6.3.3 Accompanying transport documents

**Purpose:** Communicate information for paper documents that have to be transported together with the goods, such as hazard information. This information can be communicated electronically, but still needs to be available as physical document during transport.

**Trigger:** These documents are sent by the Logistics Service Buyer to the Logistics Service Provider (freight forwarder or carrier) at the agreed upon date and time. Logistics Service Buyer and Logistics Service Provider need to decide and agree who will be responsible for printing the documents.

**Response:** Not foreseen.

#### 3.6.3.4 Transport status request

**Purpose:** To request information regarding the status of the consignment.

**Trigger:** The *Transport status request* will be sent by the Logistics Service Buyer (who can be the supplier, retailer, 3<sup>rd</sup> party warehouse or freight forwarder) to the Logistics Service Provider (the carrier). The transaction can be used at any time.

The Logistics Service Buyer may authorise other parties to have access to the transport status information, such as the consignor or the consignee.

**Response:** The *Transport Status Notification* is the response to this transaction.

#### 3.6.3.5 Transport status notification

**Purpose:** This transaction enables the transmission of status information by a freight forwarder or carrier, to the party requesting information concerning a consignment of goods, for which a Transport instruction was previously sent. Status information at a consignment level, either coded or free text, is provided in conjunction with any other information relevant to the reported status (e.g., the identification number of the truck transporting the goods item).

**Responsible party:** The *Transport status notification* will be sent by the Logistics Service Provider to the Logistics Service Buyer. The transaction may be sent on a scheduled basis at predetermined times, as a result of a direct enquiry (*Transport status request*), or following a specified event or milestone. The Logistics Service Buyer may authorise other parties to have access to the transport status information, such as the consignor or the consignee.



**Response:** Not available

### 3.6.3.6 Final Transport status notification

**Purpose:** This transaction allows sending the final status of the delivery (also known as IOD, Information on Delivery) to the Logistics Service Buyer.

Information may include actual date and time of delivery, exceptions such as damages & shortages, name of the person who signed for receipt.

**Trigger:** The *Final Transport Status Notification* will be sent by the Logistics Service Provider after the delivery.

**Response:** Not foreseen

## 3.6.4 Transactions for transport pick-up operations

### 3.6.4.1 Pick-up request

**Purpose:** Request information for the pick-up of the goods, such as the time window and loading dock.

**Trigger:** The *Pick-up request* will be sent by the Logistics Service Provider (carrier) to the Consignor before the pick-up is to take place, exact timing depends on the agreements.

**Response:** Pick-up confirmation

### 3.6.4.2 Pick-up confirmation

**Purpose:** To communicate the pick-up information to the Logistics Service Provider.

**Trigger:** After receipt of the *Pick-up Request* the Consignor will send the *Pick-up confirmation* to the Logistics Service Provider (carrier).

**Response:** Not foreseen

## 3.6.5 Transactions for transport drop-off operations

### 3.6.5.1 Drop-off request

**Purpose:** Request information for the drop-off of the goods, such as the time window and unloading dock. The transaction can also serve as pre-arrival notification to the Consignee.

The Drop-off request should only contain very basic information, such as approximate total weight, total volume, shipper, type of materials that would allow the Drop-off point to plan when this shipment (goods) should be delivered.

**Trigger:** The *Drop-off request* will be sent by the Logistics Service Provider (carrier) to the Consignee before the drop-off is to take place, exact timing depends on the agreements.

**Response:** *Drop-off* confirmation.

### 3.6.5.2 Drop-off confirmation

**Purpose:** A transaction to communicate the drop-off information to the Logistics Service Provider.

The Drop-off Response should only contain very basic information, such as date and time-window, booking-reference to quote when delivering and delivery-instructions.

**Trigger:** After receipt of the *Drop-off request* the Consignee will send the *Drop-off confirmation* to the Logistics Service Provider (carrier).

**Response:** Not foreseen



### 3.6.5.3 Signed transport documents

**Purpose:** The signed transport documents (also known as POD, Proof of Delivery) serve as proof for the Logistics Service Provider that he collected the goods at the Consignor and delivered them to the Consignee. After the transport has been carried out, the Logistics Service Provider (carrier) archives the signed transport documents.

The Logistics Service Provider may allow the Logistics Service Buyer to access the archived transport documents, for example by providing a web link.

**Trigger:** The transport documents are signed upon collection (by the Consignor) and upon delivery (by the Consignee), and after that archived by the Logistics Service Provider (carrier).

**Response:** Not foreseen.

### 3.6.6 GS1 Logistics Label (transport)

**Purpose:**

Logistics units are items made up for transport and distribution purposes, and pallets are one particular example. Using the GS1 Logistics Label containing the Serial Shipping Container Code (SSCC) allows users to identify logistics units uniquely so that they can be tracked and traced throughout the supply chain.

**Trigger:**

- It is the responsibility of the Consignor to create and apply the *carrier section* of the logistics label at the time of transport preparation. The *carrier section* of the label contains information generally known at the time of shipment, typically related to transport.
- At the time of transport, the Carrier is responsible for registering information from the *Logistics Label* for use it in further communication, such as the *Transport Status Notification*.

## 3.7 Financial settlement

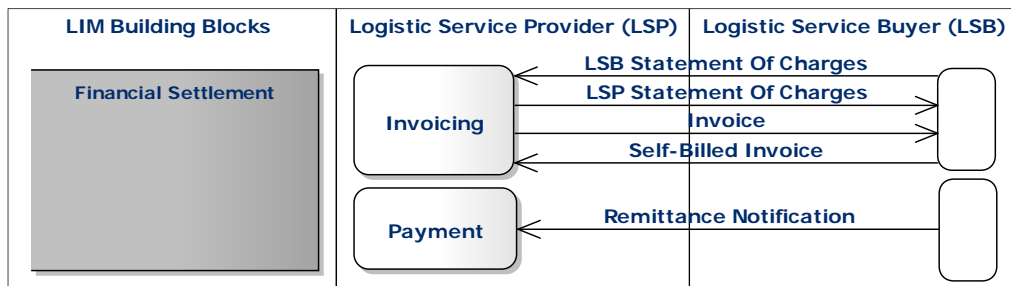
### 3.7.1 Scope

Interoperation agreement	Master data alignment	Logistics service conditions	Planning	Warehousing	Transport	Financial settlement
--------------------------	-----------------------	------------------------------	----------	-------------	-----------	----------------------

Financial settlement covers the process from the delivery of services to the Logistics Service Buyer, through to the confirmation of payment by the Logistics Service Provider. Financial settlement is based on the actual volumes/weight of the goods serviced, according to the Logistics service conditions. Financial settlement may differ depending on whether the invoicing process is triggered by the Logistics Service Provider (traditional invoicing) or by the Logistics Service Buyer (self-billing).

### 3.7.2 Transactions

Figure 3-7 LIM Financial settlement



### 3.7.2.1 LSB Freight/Service statement of charges

**Purpose:** The purpose is to instruct the Logistics Service Provider on the detailed charges as calculated by the Logistics Service Buyer. In both invoicing options, i.e. normal invoicing or self-billing, this information may be used for reconciliation and/or alignment between Logistics Service Buyer and Logistics Service Provider before the final (self-billing) invoice is created.

#### Examples of warehousing charges:

- Rent/Storage
- Handling (restacking, (re)labelling, quality control, order picking, receiving, shipping, weekend work, etc.)
- Service Orders (customisation, manipulations, etc.)

#### Examples of transport charges:

- Cost per Trade Lane
- Special Truck Drivers (ADR/Dangerous Goods)
- Drop Lot
- Multiple Stops/drop-offs
- Demurrage
- Additional Equipment
- Additional Manpower for Pick-up or Drop-off



**Note:** GS1 EDI does not contain any message supporting this process, thus this information must be sent using other communication channels.

**Trigger:** The Logistics Service Buyer generates the *Statement of Charges* monthly and/or weekly depending on the contractual agreement/Interoperation Settings.

**Response:** Not foreseen

### 3.7.2.2 LSP Freight/Service statement of charges

**Purpose:** The purpose is to instruct the Logistics Service Buyer on the detailed charges as calculated by the Logistics Service Provider. In both invoicing options, i.e. normal invoicing or self-billing, this information may be used for reconciliation and/or alignment between Logistics Service Buyer and Logistics Service Provider before the final (self-billing) invoice is produced.

#### Examples of warehousing charges:

- Rent/Storage
- Handling (restacking, (re)labelling, quality control, order picking, receiving, shipping, weekend work, etc.)
- Service Orders (customisation, manipulations, etc.)

#### Examples of transport charges:

- Cost per Trade Lane
- Special Truck Drivers (ADR/Dangerous Goods)
- Drop Lot
- Multiple Stops/drop-offs
- Demurrage
- Additional Equipment
- Additional Manpower for Pick-up or Drop-off



**Note:** GS1 EDI does not contain any message supporting this process, thus this information must be sent using other communication channels.

**Trigger:** The Logistics Service Provider generates the *Statement of Charges* monthly and/or weekly depending on the contractual agreement/Interoperation Settings.

**Response:** Not foreseen

### 3.7.2.3 Freight/Service invoice

**Purpose:** The purpose is for the Logistics Service Provider to generate and send an overview of charges to the Logistics Service Buyer for payment. The *Invoice* can be based on the charges that were detailed and agreed in the *Statement of charges*.

**Trigger:** Generated by the Logistics Service Provider monthly and/or weekly depending on the contractual agreement.

**Response:** Not foreseen

### 3.7.2.4 Self-Billed Freight/Service invoice

**Purpose:** The purpose is for the Logistics Service Buyer to generate and send an overview of charges to the Logistics Service Provider for payment by the Logistics Service Buyer. The *Self-Billed Invoice* can be based on the charges that were detailed and agreed in the *Statement of Charges*.

**Trigger:** Generated by the Logistics Service Buyer monthly and/or weekly depending on the contractual agreement.

**Response:** Not foreseen

### 3.7.2.5 Settlement (remittance information)

**Purpose:** The purpose is for the Logistics Service Buyer to inform the Logistics Service Provider on the invoices that have been paid.

**Trigger:** Generated by the Logistics Service Buyer after the payment has been made.

**Response:** Not foreseen

## 4 LIM scenarios

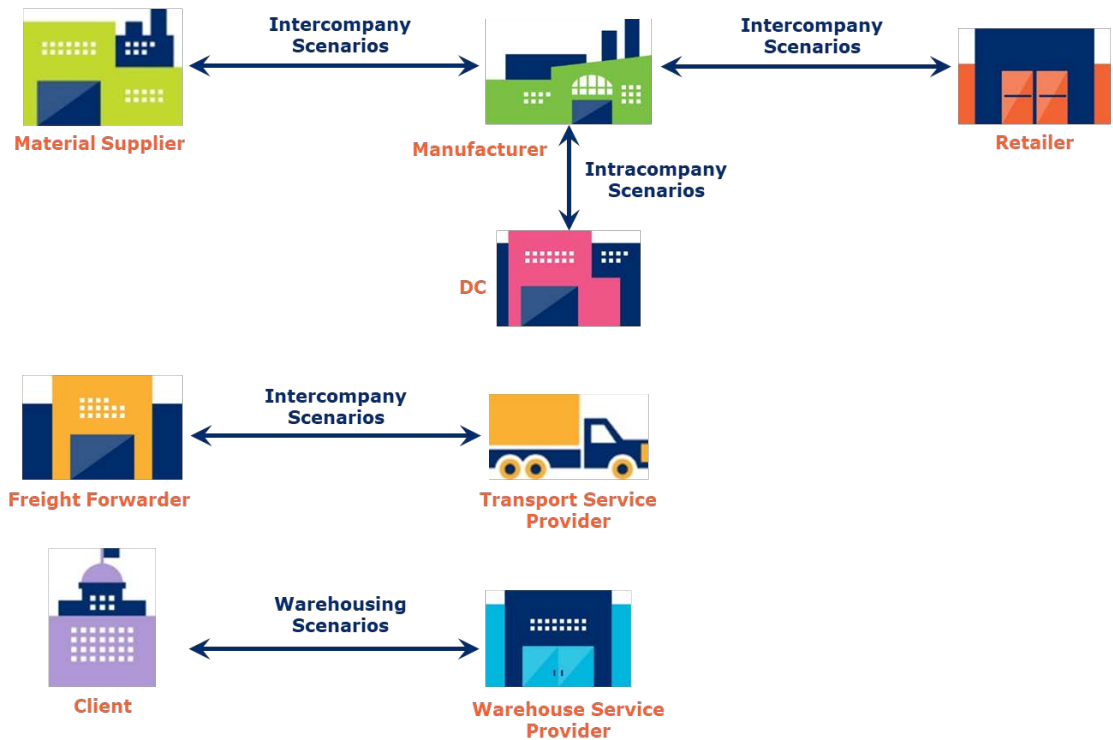
### 4.1 Scope

In this section, the transport and warehousing processes are analysed in more detail.

The diagrams have been grouped as follows:

- Intercompany scenarios between material supplier and manufacturer.
- Intracompany scenarios of manufacturer
- Intercompany scenarios between manufacturer and retailer
- Freight forwarding scenarios
- Inventory management scenarios.

**Figure 4-1** Overview of scenarios



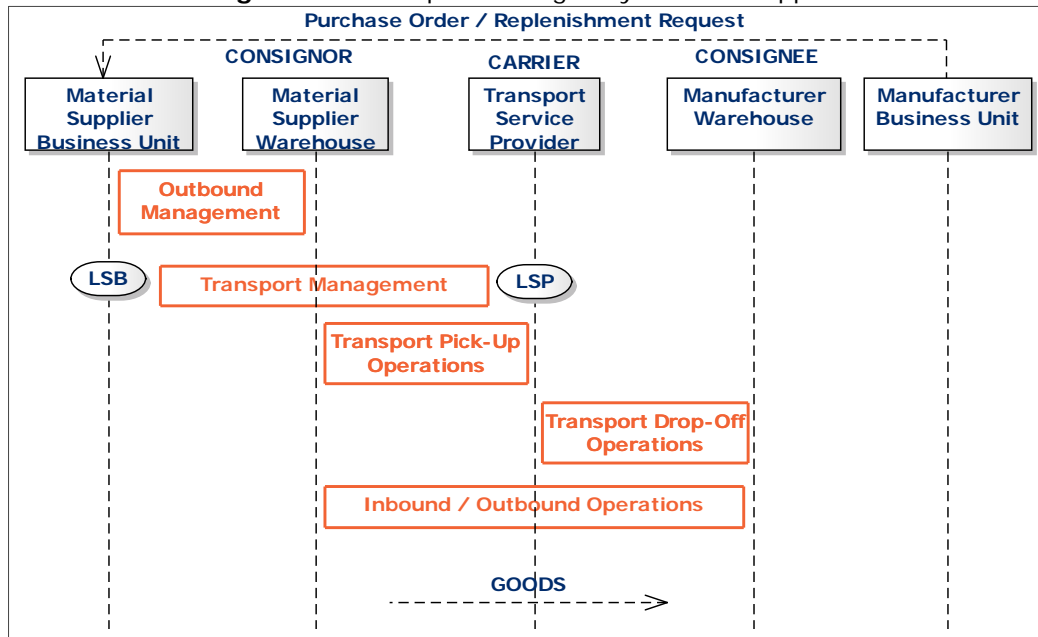
✔ **Note:** To help define the scenarios in a structured way in the diagrams instead of the individual business transactions the modules are depicted. The sequence of events is captured in the textual description and not in the diagrams. The modular diagrams cannot capture the detailed sequence of the transactions.

## 4.2 Scenarios between material supplier and manufacturer

### 4.2.1 Transport managed by material supplier

The business process of shipping the goods from a Material supplier to a manufacturer executed by a transport service provider. The supplier will provide shipping instructions to the transport service provider. In this scenario, the transport service provider will pick up the goods directly from the Material supplier warehouse at a scheduled and agreed time. The transport service provider is responsible for pick-up and drop-off appointments.

Figure 4-2 Transport managed by material supplier



The sequence of events is as follows:

- The manufacturer will request the material supplier to replenish the inventory in their warehouse. Can be done either with purchase order or with SMI/SMOI process.
- The material supplier will instruct the warehouse to prepare a despatch (**outbound management**). This is an internal process.
- The material supplier will instruct the transport Service Provider to carry out the transport. Optionally the transport service provider sends a Response to the material supplier. The transport service provider will prepare the transport documentation such as the CMR or waybill (**transport management**).
- The material supplier may ask for intermediate transport status notifications (**transport management**).
- The transport service provider may need to book a pick-up slot at the material supplier warehouse based on transport instruction previously confirmed. Material supplier warehouse confirms the pick-up slot request (**pick-up operations**).
- The material supplier prepares the shipment, then prints and applies the GS1 Logistics Label.
- Transport service provider arrives at the supplier warehouse to collect the goods. The goods are loaded. The material supplier will provide the delivery note to the transport service provider. The transport service provider will complete the transport documentation (**transport pick-up operations**).
- Transport service provider may need to book a drop-off slot at the manufacturer warehouse based on the transport instruction previously confirmed. Manufacturer warehouse confirms the drop-off slot request (**transport drop-off operations**).
- The material supplier will notify the manufacturer of the despatch (**outbound operations**).
- Transport service provider arrives at the manufacturer warehouse. Transport service provider is directed to the unloading dock. The goods are unloaded. The manufacturer signs off the waybill or delivery note. Transport service provider leaves the site (**transport drop-off operations**).
- The transport service provider may inform the supplier that the transport has been carried out.
- The manufacturer will receive the goods and notify the material supplier of the receipt (**inbound operations**).

#### Most common variations

**Variation 1:** The material supplier organises the appointments for pick-up and drop-off. In that case, the pick-up and drop-off times will be communicated directly to the transport service provider via the Transport instruction.

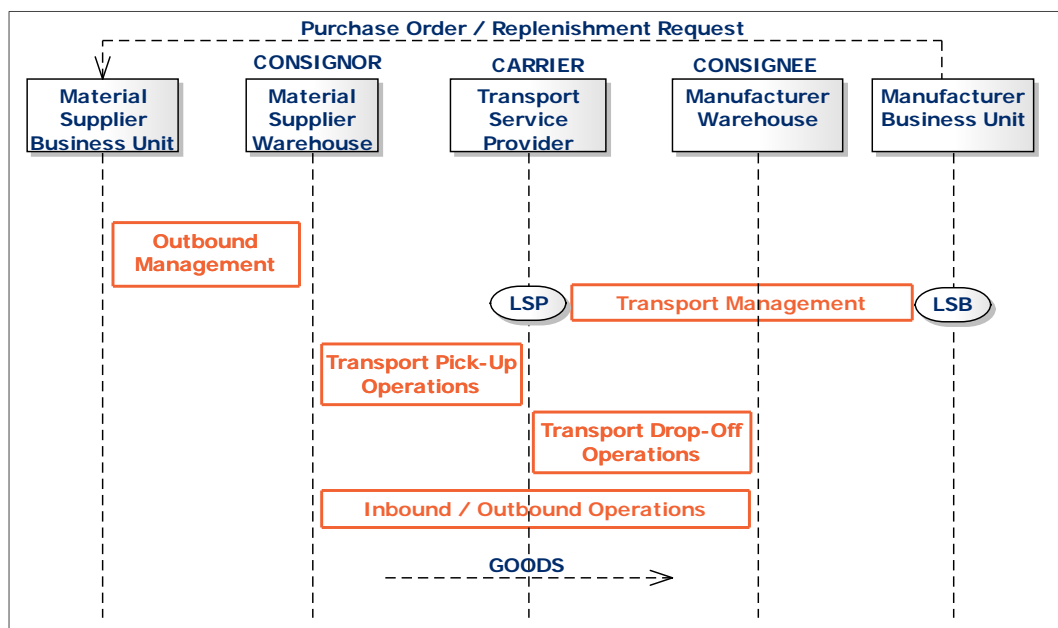
**Variation 2:** A warehouse Service Provider can manage the transport on behalf of the material supplier. In that case, he will act as the LSC in the Transport Management process.

#### 4.2.2 Transport managed by manufacturer

The business process of shipping the goods from a material supplier to a manufacturer executed by a transport service provider. The manufacturer will provide shipping instructions to the transport service provider. In this scenario, the transport service provider will pick up the goods directly from the material supplier warehouse at a scheduled and agreed time.

The main difference from the previous scenario is that now the manufacturer is involved in the transport of the goods.

**Figure 4-3** Transport managed by manufacturer



The sequence of events is as follows:

- The manufacturer will request the material supplier to replenish the inventory in his warehouse. Can be done either with purchase order or with SMI/SMOI process.
- The material supplier will instruct the warehouse to prepare a despatch (**outbound management**) and inform that the manufacturer will manage the transport through his LSP. This is an internal process.
- The manufacturer will instruct the transport provider to carry out the transport. Optionally the transport service provider sends a Response to the manufacturer. The transport service provider will prepare the transport documentation such as the CMR or waybill (**transport management**).
- The manufacturer may ask for intermediate transport status notifications (**transport management**).
- The transport service provider may need to book a pick-up slot at supplier warehouse based on transport instruction previously confirmed. Material supplier warehouse confirms the pick-up slot request (**pick-up operations**).
- The material supplier prepares the shipment, and prints and applies the GS1 Logistics Label.
- Transport service provider arrives at the supplier warehouse to collect the goods. The goods are loaded. The material supplier will provide the delivery note to the transport service provider.

The transport service provider will complete the transport documentation (**transport pick-up operations**).

- Transport service provider may need to book a drop-off slot at manufacturer warehouse based on the transport instruction previously confirmed. Manufacturer warehouse confirms the drop-off slot request (**transport drop-off operations**).
- The material supplier will notify the manufacturer of the despatch (**outbound operations**)
- Transport service provider arrives at the manufacturer warehouse. Transport service provider is directed to the unloading dock. The goods are unloaded. The manufacturer signs off the waybill or delivery note. Transport service provider leaves the site (**transport drop-off operations**).
- Optionally the transport service provider may inform the manufacturer that the transport has been carried out.
- The manufacturer will receive the goods and notify the supplier of the receipt (**inbound operations**).

#### Most common variations

Variation 1: The manufacturer organises the appointments for pick-up and drop-off. In that case, the pick-up and drop-off times will be communicated directly to the transport service provider via the Transport instruction.

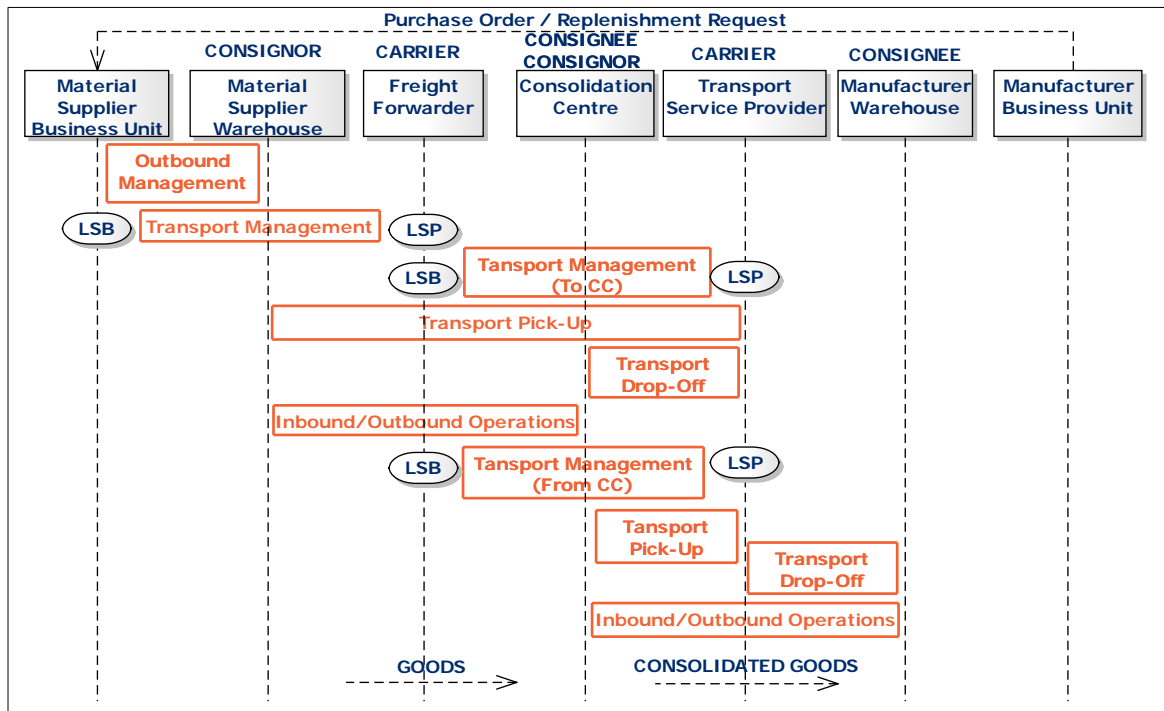
Variation 2: Warehouse Service Provider can manage the transport on behalf of the manufacturer. In that case, he will act as the LSC in the Transport Management process.

### 4.2.3 Consolidated transport managed by material supplier

The business process of shipping the goods consolidated from a material supplier to a manufacturer supported and executed by a Consolidation Centre. The material supplier will provide instructions on the goods to pick-up from different material supplier warehouses. For the material supplier the Freight Forwarder acts as the principal LSP. The Freight Forwarder may involve other LSPs such as Consolidation Centres and transport service providers.




**Note:** This scenario is very similar to the [Merge-In-Transit](#) scenario.

**Figure 4-4** Consolidated transport managed by supplier


The sequence of events is as follows:

- The manufacturer will request the material supplier to replenish the inventory in his warehouse. Can be done either with purchase order or with SMI/SMOI process.
- The material supplier will instruct his warehouses to prepare despatch (**outbound management**). This is an internal process.
- The material supplier will instruct the Freight Forwarder to carry out the transport. Optionally the Freight Forwarder will send a Response to the material supplier (**transport management**).
- The Freight Forwarder will act now as the LSC and give the instructions to one or several transport providers. The transport providers will prepare the transport documentation such as the CMR or waybill (**transport management to CC**).
  - The transport service provider may need to book a pick-up slot at supplier warehouse (unless it was already stated in the transport instruction provided by the supplier or pre-aligned) based on transport instruction previously confirmed. Plant warehouse confirms the pick-up slot request (**pick-up operations**).
  - The material supplier prepares the shipment, and prints and applies the GS1 Logistics Label.
  - Transport service provider arrives at the supplier warehouse to collect the goods. The goods are loaded. The material supplier will provide the delivery note to the transport service provider. The transport service provider will then complete the transport documentation (**transport pick-up operations**).
- After the pick-up from the different locations by carriers, the consolidation centre receives and groups the goods (**transport pick-up/drop-off to CC**).
- The Freight Forwarder centralises all the data about the Despatch Notifications from the different consignor locations (**inbound/outbound operations to CC**).
- After grouping of the different goods, the consolidation centre organises the delivery to the final consignee. The Consolidation Centre will create the Delivery Note, which combines the delivery notes of all original shipments (**inbound/outbound operations from CC**).
- The Freight Forwarder will give the instructions to one or several transport providers to ship the consolidated goods. The transport providers will prepare the transport documentation such as the CMR or waybill (**transport management from CC**).



- The Consolidation Centre on behalf of the material supplier will notify the manufacturer of the despatch (**outbound operations**).
-  **Note:** The despatch notification will contain information about the consolidated shipment, and will specify both the Consolidation Centre as well as the material supplier.
- Transport service provider may need to book a drop-off slot at the manufacturer warehouse based on the Transport instruction previously confirmed. Manufacturer warehouse confirms the drop-off slot request (**transport drop-off operations**).
- Transport service provider arrives at the manufacturer warehouse. Transport service provider is directed to the unloading dock. The goods are unloaded. The manufacturer signs off the waybill or delivery note. Transport service provider leaves the site (**transport drop-off operations**).
- Optionally the transport service provider may inform the freight forwarder that the transport has been carried out.
- The manufacturer will receive the goods and notify the supplier of the receipt (**inbound operations**).

#### Most common variations

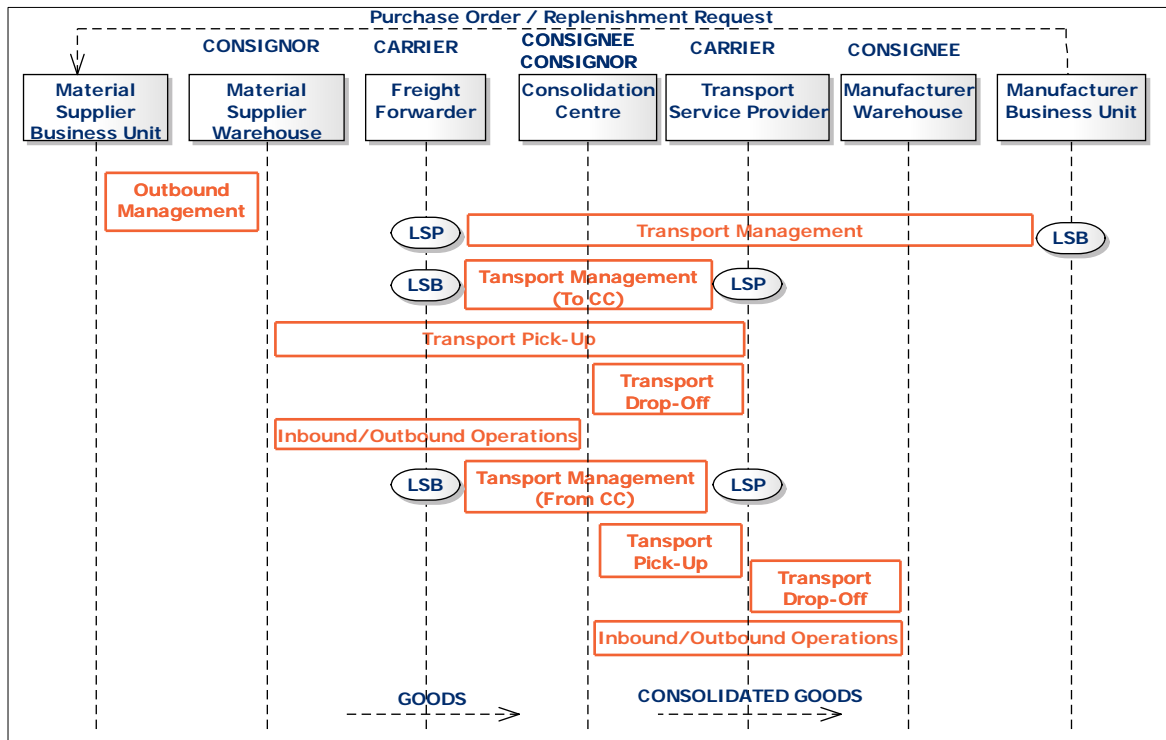
In case the consolidation centre can or will not manage the outbound operations the material supplier business unit will need take care of this. This means that after shipment, the Consolidation Centre will send the Despatch Notification to the material supplier business unit and he will forward it to the manufacturer warehouse. The manufacturer will send the Receipt Notification directly to the material supplier business unit.

#### 4.2.4 Consolidated transport managed by manufacturer

The business process of shipping the goods consolidated from a supplier to a manufacturer supported and executed by Consolidation Centre (CC). Manufacturer will provide instructions on the goods to pick-up from different supplier's warehouses. For the manufacturer the Freight Forwarder acts as the principal LSP. The Freight Forwarder may involve other LSPs such as Consolidation Centres and transport service providers.

Main difference with the previous scenario is that here the manufacturer instead of the material supplier acts as the LSC for the consolidated transport (**transport management**).

**Figure 4-5** Consolidated transport managed by manufacturer



Changes to the previous scenario:

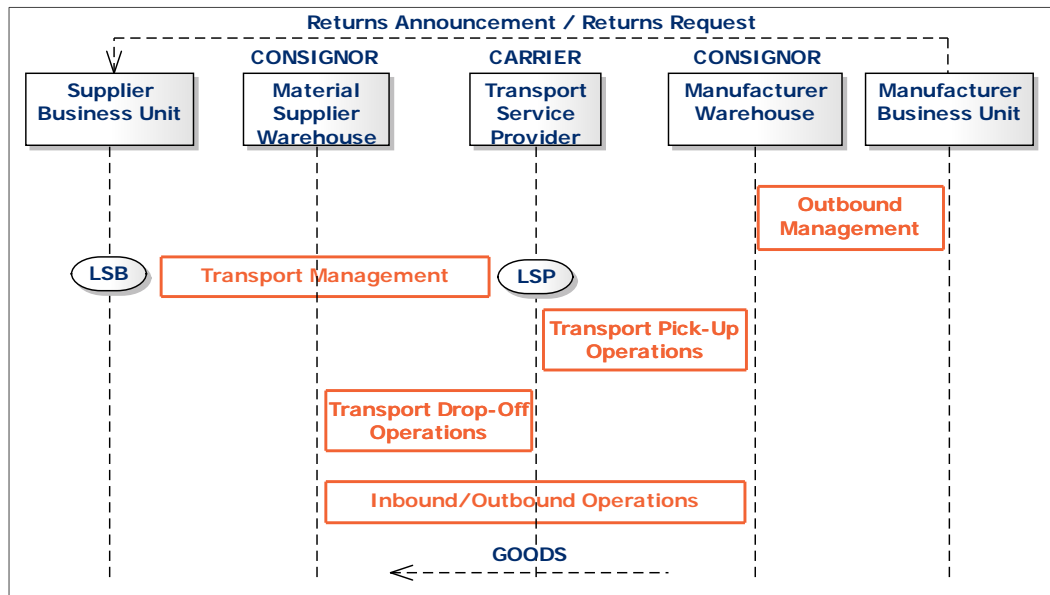
- The Manufacturer will instruct the Freight Forwarder to carry out the transport. Optionally the Freight Forwarder will send a Response to the manufacturer (**transport management**).
  - The Freight Forwarder centralises all the data about the Despatch Notifications from the different material supplier locations (**inbound/outbound operations to CC**).
  - The Consolidation Centre will notify the manufacturer of the despatch (**outbound operations**).
- ✓ **Note:** The Despatch Notification will contain information on the consolidated shipment, and will specify both the Consolidation Centre as well as the material supplier.
- The manufacturer will receive the goods and notify the Consolidation Centre of the receipt (**inbound operations**).

#### Most common variations

In case the Consolidation Centre can or will not manage the inbound operations the manufacturer business unit will need take care of this. This means that after shipment, the material supplier will send the Despatch Notification to the manufacturer business unit and he will forward it to the Consolidation Centre. The manufacturer warehouse will send the Receipt Notification directly to the material supplier.

#### 4.2.5 Returns (transport managed by material supplier)

The business process of returning goods from a manufacturer to a material supplier executed by a transport service provider is also called “reverse logistics”. The material supplier will provide shipping instructions to the transport service provider. In this scenario, the transport service provider will pick up the goods directly from the manufacturer’s warehouse at a scheduled and agreed time.

**Figure 4-6 Returns (transport managed by material supplier)**


The sequence of events is as follows:

- The manufacturer will request the material supplier to return the shipments or inventory from his warehouse.
- The material supplier will instruct the transport provider to carry out the transport. Optionally the transport service provider sends a Response to the material supplier. The transport service provider will prepare the transport documentation such as the CMR or waybill (**transport management**).
- The material supplier may ask for intermediate transport status notifications (**transport management**).
- The transport service provider may need to book a pick-up slot at manufacturer's warehouse based on Transport instruction previously confirmed. Manufacturer warehouse confirms the pick-up slot request (**pick-up operations**).
- If needed the manufacturer prepares or repack the shipment, then prints and applies the GS1 Logistics Label or use existing one.
- Transport service provider arrives at the manufacturer warehouse to collect the goods. The goods are loaded. The material supplier will provide the delivery note to the transport service provider. The transport service provider will complete the transport documentation (**transport pick-up operations**).
- Transport service provider may need to book a drop-off slot at the material supplier warehouse based on the transport instruction previously confirmed. Material supplier warehouse confirms the drop-off slot request (**transport drop-off operations**).
- Transport service provider arrives at the material supplier warehouse. Transport service provider is directed to the unloading dock. The goods are unloaded. The supplier signs off the waybill or delivery note. Transport service provider leaves the site (**transport drop-off operations**).
- The material supplier will receive the goods and notify the manufacturer of the receipt (**inbound operations**).

#### Most common variations

A Warehouse Service Provider can manage the transport on behalf of the material supplier. In that case, he will act as the LSC in the Transport Management process.

## 4.3 Manufacturer intra-company scenarios

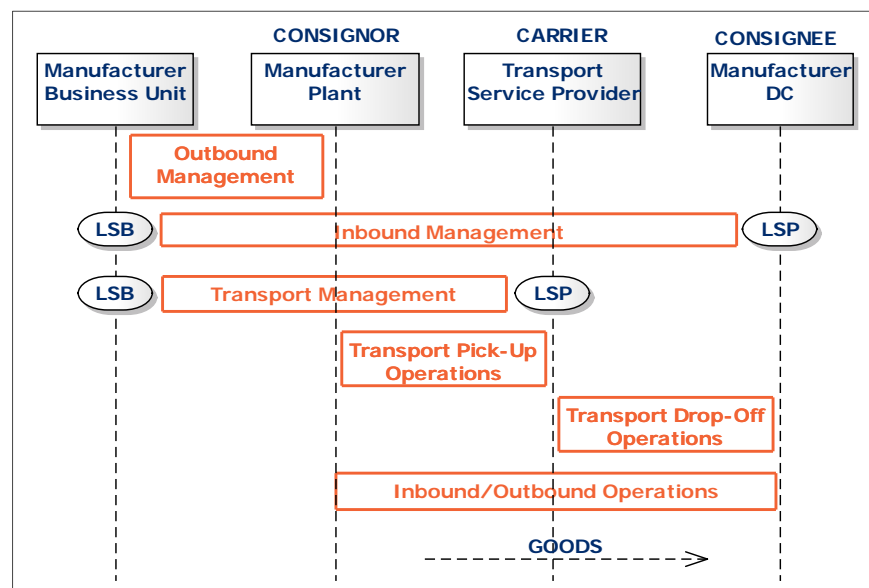
### 4.3.1 Transport from manufacturer plant to manufacturer DC

The business process of distributing finished goods via an LSP operated DC. For replenishment of the DC, the manufacturer involves a transport service provider to transport the goods.

The distribution of the goods from the DC to the retailer will be described in chapter 4.


For the purpose of truck turnaround performance measures, times stamps at various milestones/instances are captured.

**Figure 4-7** Transport from manufacturer plant to manufacturer DC



The sequence of events is as follows:

- Replenishment planning system indicates shipment to be made from the manufacturer plant to the manufacturer DC.
- Replenishment order is created in the manufacturer supply chain/ERP system and can inform the manufacturer DC (**outbound management**).
- The manufacturer plant calls-off/informs the transport service provider of transportation need for the replenishment shipment. Transport service provider confirms transportation available for replenishment shipment (**transport management**).
- Plant warehouse picks, loads (internal WMS) and announces replenishment shipment to LSP DC (**inbound/outbound operations**).
- Transport service provider books pick-up slot at plant warehouse based on transport instruction previously confirmed. Manufacturer warehouse confirms the pick-up slot request (transport pick-up operations). Transport service provider arrives at the plant warehouse.
  - If drop trailer is used, transport service provider is directed to place the trailer in a specific parking lot and then leaves the site. Plant warehouse calls-off transport service provider for the replenishment shipment trailer pick-up. Transport service provider confirms the call-off request for trailer pick-up (transport pick-up operations). Transport service provider arrives at the plant warehouse, is directed to the parking lot where the full trailer is standing and picks it up.
  - If drop trailer is not used, transport service provider is directed to the plant warehouse dock door and loads the goods.
- Transport service provider leaves the site.


**Note:** Time stamps of arrival and departure at the manufacturer plant are logged (**Transport management**)

- The transport service provider books a drop-off slot at the manufacturer DC, which is also acknowledged by the manufacturer DC (**Transport Drop-Off Operation**).
- Transport service provider arrives at the manufacturer DC, is directed to the unloading dock. The manufacturer DC checks and unloads the goods, signs the transport documents (**Transport Drop-Off Operation**) and informs the manufacturer plant of the receipt (**Inbound/Outbound Operations**).
- The transport service provider confirms that the transport has been completed (**Transport Management**).

#### Most common variations

##### Variation 1: Transport from manufacturer DC to manufacturer DC.

This scenario can occur when goods at the manufacturer DC need to be further distributed or replenished to other manufacturer DC's. In these cases, the outbound management process is no longer confined to the manufacturer's internal ERP system but is also extended to involve the LSP.

##### Variation 2: Returns from manufacturer DC to manufacturer plant

There are two possible return processes.

1. Goods are not physically received and unloaded at the manufacturer DC but are immediately returned to the originating manufacturer plant on the same transport.
2. Goods are received at the manufacturer DC and afterwards returned to the originating manufacturer plant on a different transport. In this case, the manufacturer DC does the transport management.

##### Variation 3: Transport is done by the same LSP that is operating the manufacturing DC.

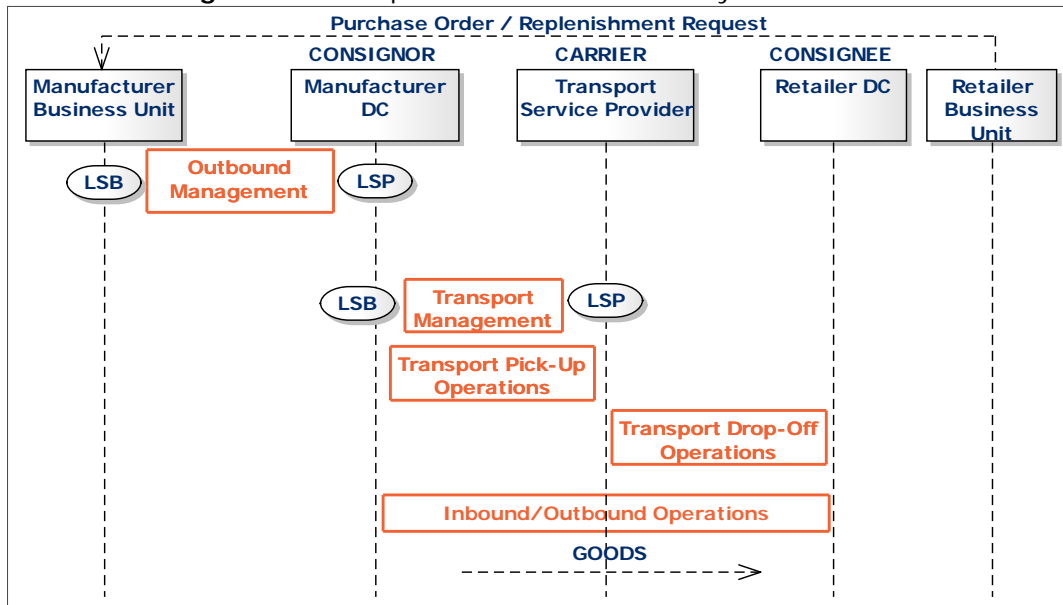
In this case the LSP will handle the transport management and potentially also the transport pick-up and drop-off operations.

## 4.4 Scenarios between manufacturer and retailer

### 4.4.1 Transport to retailer DC driven by manufacturer

The manufacturer assigns an LSP with the warehouse management and the transport of the ordered goods from his operated DC to the retailer DC. The LSP operates the transport with his own transport equipment or instructs another LSP for the transport. The LSP is responsible for the picking of goods as well as the fulfilment of the transport service. This is the classical process in the CPG Industry where a manufacturer assigns an LSP to manage the manufacturer's DC and the transport.

The most common scenario assumes the warehousing LSP is always directly communicating with the transport service provider. This has been assumed in the detailed description.

**Figure 4-8** Transport to retailer DC driven by manufacturer


The sequence of events is as follows:

- Manufacturers will ship goods to retailer DC based on any type of Demand/Pull signal received from the retailer
  - Manufacturer will instruct the warehouse what (and how many) to pick (**outbound management**).
  - The Warehousing LSP may consolidate Despatch instructions into larger shipments (to gain transportation benefits).
  - It may also be necessary that the Warehousing LSP split a Despatch instruction into smaller shipments because the total volume and/or weight of the Despatch instruction is too large to be handled as a single shipment by the intended transport provider.
- ✓ **Note:** In case of a Despatch instruction split into multiple shipments, usually the Warehousing LSP will provide Despatch Notification for each shipment despatched. The manufacturer will use the information to update the inventory-levels as well as the outstanding balance on the Despatch instruction. On the final shipment for a given Despatch instruction, the Warehousing LSP should indicate this fact on the Despatch Notification to allow the manufacturer to “close” the Despatch instruction.
- Once shipments have been created in the Warehousing LSP systems the Warehousing LSP will send appropriate Transport instructions to the transport provider assigned to each shipment (**transport management**).
  - Transport provider may confirm the Transport instruction will be executed as requested (**transport management**).
  - Transport provider may arrange for a Pick-up request with the manufacturer warehouse. Warehouse may then confirm the Pick-up request (**transport pick-up operations**).
  - Transport provider may arrange for a Drop-off request with the retailer DC. Warehouse may then confirm the Drop-off request (**transport drop-off operations**).
  - Goods are despatched in shipments from the manufacturer warehouse via the transport provider to the retailer DC. These shipments will carry the correct labels (GS1 Logistics Labels) to enable transportation by transport provider and receipt by the retailer DC.
  - Upon despatch of the shipments, the manufacturer warehouse may send a Despatch Notification to the retailer DC (**inbound/outbound operations**).

- A copy of this Despatch Notification usually (but not always) is sent from the Warehousing Service Provider to the manufacturer to inform him of the despatch as well as enable proper updating of inventory in the manufacturer system (**inbound/outbound operations**).
- During the execution of transportation, the manufacturer may request at any time the (latest) status of the shipment (**transport management**).
- The transport provider may at any point send (latest) status of the shipment to the manufacturer. This may be in response to the request received from manufacturer but the transport provider may also initiate the transfer of this information based on schedules agreed with the manufacturer (**transport management**).
- Upon delivery of the shipment, the transport provider will always provide the manufacturer with the Final Transport Notification that contains the agreed details on the delivery made –including any exceptions (**transport management**).
- The retailer DC may also send a Receipt Notification to the manufacturer warehouse (**inbound/outbound operations**).
- The manufacturer warehouse may send Delivery Status information (**inbound/outbound operations**) to the manufacturer business unit.

#### Most common variations

##### Common variation 1: manufacturer operated DC.

The manufacturer DC may also be self-operated by manufacturer. In this case, the **outbound module** may not be required (as both production and warehousing may then be managed in same IT-system). In this case, the manufacturer will also communicate directly with the transport provider/s. Therefore, in that case the **transport module** will extend between manufacturer and Transport LSP.

##### Common variation 2: Warehousing LSP outsources Transportation Management

The warehousing LSP may communicate with one or more Transport LSP who in turn communicate/s with the carriers. See Freight Forwarding Chapter for more details on the interactions between parties in this case.

##### Variation 3: Direct shipment from manufacturer plant

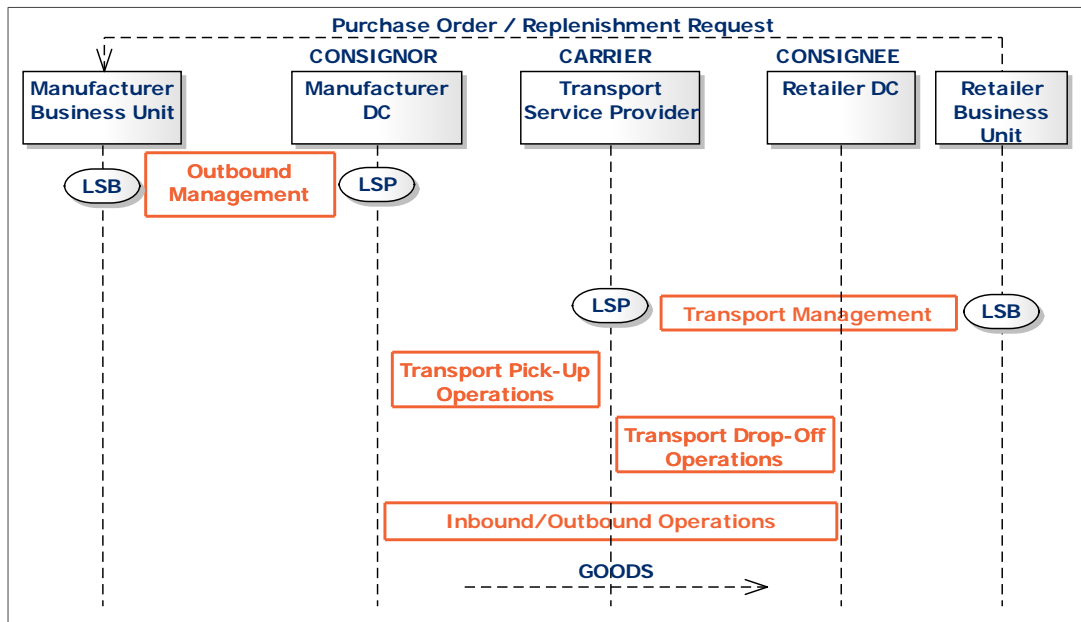
In some cases, the manufacturer may ship goods directly from the manufacturing plant to the retailer DC. This will usually be for large (full truckload) quantities only. In such a scenario the information-flows will generally be exactly the same as in a shipment from manufacturer self-operated DC (see variation 1).

Retailer DC may also be operated by a Logistics Service Provider. In this case, the inbound module may be required (as the retail warehousing may then be managed in another IT-system).

#### 4.4.2 Transport to retailer DC driven by retailer

The retailer assigns an LSP to manage the transport of the ordered goods from the manufacturer DC to the retailer DC or operates the transport with his own transport equipment. The retailer has all the required information to manage the transport service. This scenario is most common with large retailers who see logistics as a core competence.

In the detailed description, it has been assumed that the retailer warehouse is managed by the retailer itself.

**Figure 4-9** Transport to retailer DC driven by retailer


The sequence of events is as follows:

- Manufacturers will schedule deliveries to retailer DC based on any type of Demand/Pull signal received from the retailer.
  - Manufacturer will instruct the manufacturer DC what (and how many) to pick (**outbound management**).
  - The manufacturer will notify the retailer when ordered materials are available for Pick-up (**inbound/outbound operations**). This flow may not be required in case, the retailer and manufacturer have (detailed) agreements on schedules for Goods Ready after the manufacturer receives the Demand/Pull signal from the retailer. In that case the retailer can plan pick-up by a transport service provider based on the agreed schedules without having to receive confirmation Goods are ready for Pick-up.
  - The retailer will then instruct the transport provider what shipments need to be Picked Up from the manufacturer warehouse and to which of the retailer DC's they are to be delivered (**transport management**).
  - Transport provider may confirm the Transport instruction will be executed as requested (**transport management**).
  - Transport provider may arrange for a Pick-up request with the manufacturer warehouse. Manufacturer warehouse may then confirm the Pick-up Booking (**transport pick-up operations**).
  - Transport provider may arrange for a Drop-off request with the retailer warehouse. Warehouse may then confirm the Drop-off request (**transport drop-off operations**).
  - Goods are despatched in shipments from the manufacturer warehouse via the transport provider to the retailer DC. These shipments will carry the correct labels (GS1) to enable transportation by transport provider and receipt by the retailer DC. Upon Despatch of the shipments, the manufacturer warehouse may send a Despatch Notification to the retailer DC. (**inbound/outbound operations**)
- Note:** A copy of this Notification usually is sent from the Warehousing Service Provider to the manufacturer to inform him of the despatch as well as enable proper updating of inventory in the manufacturer system (**outbound**).
- During the execution of Transportation, the retailer may request at any time the (latest) status of the shipment (The transport provider may at any point send (latest) status of the shipment to



the retailer. This may be in response to the request received from Retailer but the transport provider may also initiate the transfer of this information based on schedules agreed with the retailer (**transport management**).

- Upon delivery of the shipment, the transport provider will always provide the retailer with the Final Transport Notification that contains the agreed details on the delivery made – including any exceptions (**transport management**).
- The retailer DC may also send a receipt Notification to the manufacturer warehouse (**inbound/outbound operations**).
- The manufacturer warehouse may send Delivery Status information to the manufacturer (**outbound management**).

**Most common variations**

Common variation 1: Retailer DC managed by external LSP. In this case, the **inbound module** will need to be implemented between the retailer and his warehousing LSP

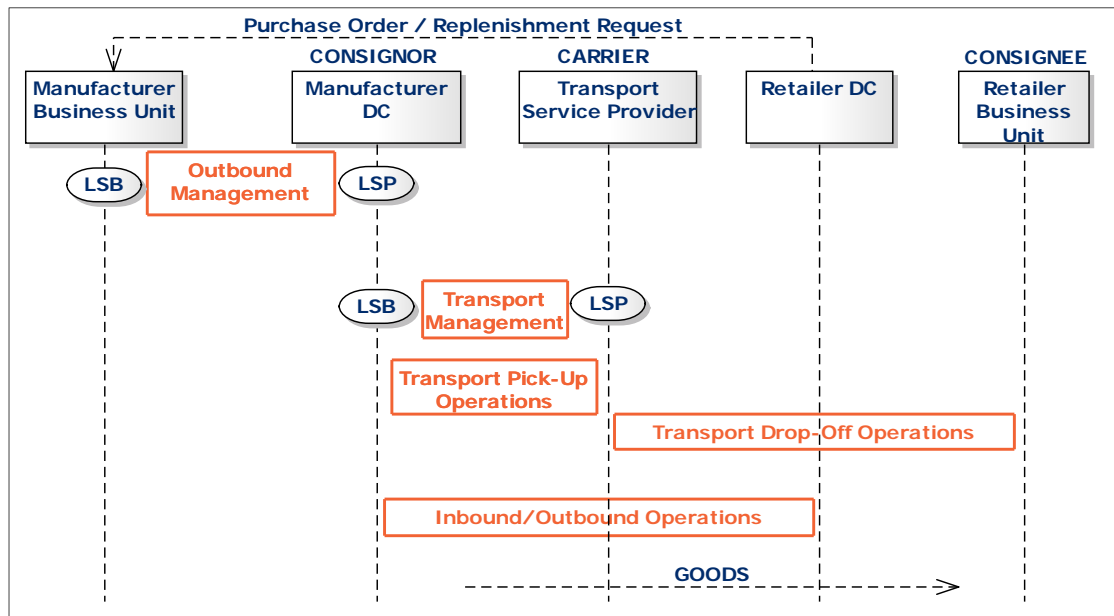
Common variation 2: Manufacturer operates DC himself. In this case, the **outbound module** between DC and manufacturer may not be required.

**4.4.3 Direct delivery to retailer store**

The manufacturer assigns an LSP for warehouse management and transport of the ordered goods from the manufacturer’s DC to the retailer store. The LSP operates the transport with his own transport equipment or instructs another LSP for the transport. The LSP is responsible for the picking of goods as well as the fulfilment of the transport service. This scenario is typically used for special goods or for large stores that order a full truckload from one manufacturer, for example beverages.

The most common scenario assumes the warehousing LSP is always directly communicating with the transport service provider. This has been assumed in the detailed description.

**Figure 4-10** Direct delivery to retailer store



The sequence of events is as follows:

- Manufacturer will ship goods to the retailer store based on any type of Demand/Pull signal received from the retailer business unit.

- ✔ **Note:** This scenario assumes that the retailer store does not contact the manufacturer directly to request a delivery to the store. In some businesses, the manufacturer may receive the orders directly from the stores i.e. small businesses like kiosks, bakeries, and food service business.
  
- Manufacturer will instruct the manufacturer DC what (and how many) to pick (**outbound management**).
- Once shipments have been created in the manufacturer DC systems the he will send appropriate Transport instructions to the transport provider assigned to each shipment (**transport management**).
- Transport provider may confirm the Transport instruction will be executed as requested (**transport management**).
- Transport provider may arrange for a Pick-up request with the manufacturer warehouse. Warehouse may then confirm the Pick-up request (**transport pick-up operations**).
- Transport provider might (but most likely will not) arrange for a Drop-off request with the retailer store. The store may then confirm the Drop-off request (**transport drop-off operations**).
- Goods are despatched in shipments from the manufacturer warehouse via the transport provider to the retailer store. These shipments will carry the correct labels (GS1 Logistics Labels) to enable transportation by transport provider and receipt by the retailer store.
- Upon despatch of the shipments, the manufacturer warehouse may send a Despatch Notification to the retailer business unit (**inbound/outbound operations**).
  
- ✔ **Note:** The retailer business unit needs to send a copy of notification to the retailer store (e.g., phone or fax) that shipment/goods are to be delivered.
  
- A copy of this Despatch Notification usually (but not always) is sent from the Warehousing Service Provider to the manufacturer to inform him of the despatch as well as enable proper updating of inventory in the manufacturer system (**inbound/outbound operations**).
- During the execution of Transportation, the manufacturer may request at any time the (latest) status of the shipment (**transport management**).
- The transport provider may at any point send (latest) status of the shipment to the manufacturer. This may be in response to the request received from manufacturer but the transport provider may also initiate the transfer of this information based on schedules agreed with the manufacturer (**transport management**).
- Upon delivery of the shipment, the transport provider will always provide the manufacturer with the Final Transport Notification that contains the agreed details on the delivery made – including any exceptions (**transport management**).
- The retailer business unit may also send a receipt Notification to the manufacturer warehouse (**inbound/outbound operations**).
  
- ✔ **Note:** Retailer business unit needs to receive some kind of notification from retailer store (e.g., phone or fax) that the goods have been delivered.
  
- The manufacturer DC may send Delivery Status information to the manufacturer (**outbound management**).

#### Most common variations

##### Common variation 1: Manufacturer operated DC.

The manufacturer operates the DC by himself. This is a classic process in the FMCG Industry, where a manufacturer operates own DC and has own transport equipment or uses the services of a

transport provider to deliver the retailer stores without using a retailer DC (Self-operated DC). In this case, the manufacturer will communicate directly with the transport provider/s. Therefore, in that case the **transport management module** will extend between manufacturer and Transport.

Common variation 2: Manufacturer managed Transport.

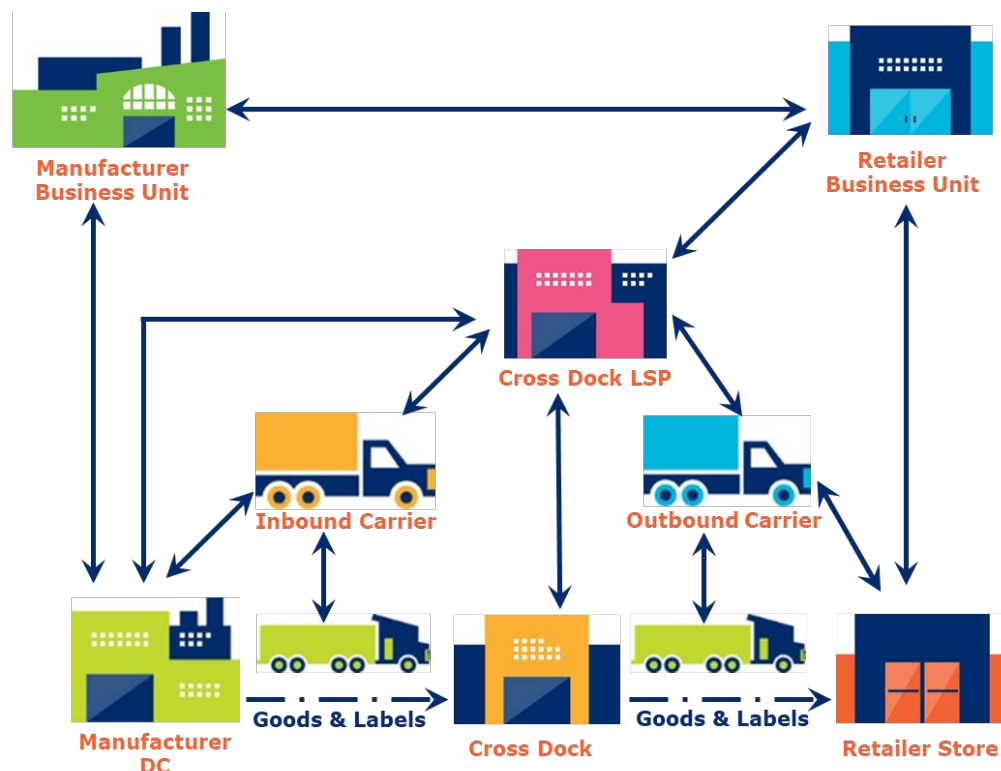
The DC is operated by an LSP, but the manufacturer manages transportation himself. (Self-managed Transport). Manufacturer DC may also be self-operated by manufacturer. In this case, the **outbound module** may not be required (as both production and warehousing may then be managed in same IT-system). In this case, the manufacturer will also communicate directly with the transport provider/s. Therefore, in that case the **transport management module** will extend between manufacturer and Transport LSP as shown in diagram above.

#### 4.4.4 Cross-docking to retailer store

In this scenario, the manufacturer delivers goods using his own transport equipment to the cross-docking point or he instructs an LSP to manage the transport. The cross-docking point can be handled by the retailer or by an LSP acting on behalf of the retailer or the manufacturer (LSP is referred to as cross-dock LSP below).

From the cross-docking point to the retailer store, the transport is done with the retailer transport equipment or the retailer instructs the cross-dock LSP to manage the transport. The cross-dock may be dedicated to a single retailer or an LSP operating the cross-dock may serve multiple retailers simultaneously (e.g., in so-called Urban Consolidation centres).

**Figure 4-11** Cross-docking to retailer store



This scenario is typically for products that have a high turnover, are highly perishable or incur high costs for storage. In the cross-docking point, the goods are handled but there is no long-term storage, usually they will be sent to the final destination within a day from when they arrive at the cross-docking point.

The most common model here is that the cross-docking point will not pick and despatch based on GTIN (product-codes). The cross-docking points will receive shipments from the individual manufacturers and will then despatch these shipments unchanged to the retailer store. Shipments received from multiple manufacturers may be consolidated into single shipments to the retailer store. Shipments received at the cross-docking point will NOT be split across multiple destinations;

each shipment received is already destined for a single specific final delivery point. This report refers to this model as Pre-Allocated cross-docking operations.

A common variation to this scenario is that the cross-docking point also provides a service to do Break-Bulk for the retailer. In that scenario the shipments received from the manufacturer will be “split” across multiple separate deliveries to the retailer store. The cross-docking point will then have to pick based on GTIN and perform a number of additional checks on quantities received at and quantities shipped from the cross-docking point. This model is referred to as Break-Bulk cross-docking operations.

For the sake of clarity, the description of the scenario will be divided into two logical parts.

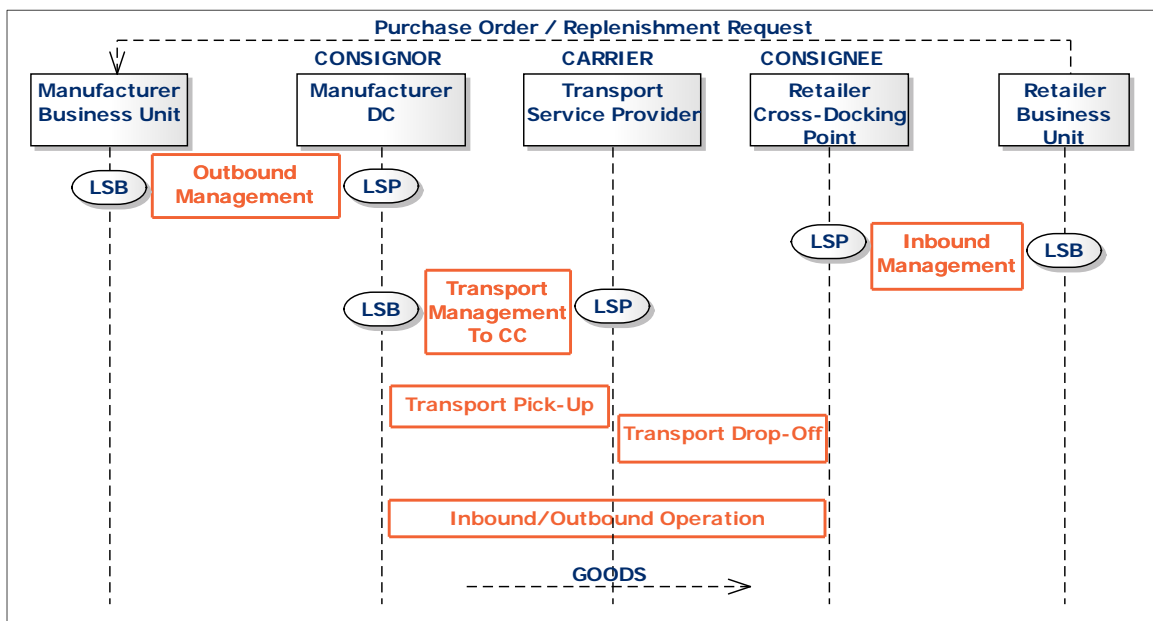
1. The shipment/s moving from the manufacturer’s DC into the cross-docking point.
2. The shipments moving from the cross-docking point into the retailer stores.

#### 4.4.4.1 Transport from manufacturer DC into the cross-docking point

Below diagram describes the information exchanges related to the movements from manufacturer DC into the cross-docking point.

Diagram below assumes a DC operated by manufacturer himself. Refer to section [Transport to Retailer DC driven by Manufacturer](#) for more details on information exchanges in the case where manufacturer uses LSP for Warehousing. For the case, where the manufacturer uses a Warehousing LSP who outsources Transport Management, refer to the section on [Shipments through Freight Forwarders](#).

**Figure 4-12** Transport from manufacturer DC into the cross-docking point






The sequence of events is as follows:

- Manufacturers will ship goods to the retailer cross-docking point based on any type of Demand/Pull signal received from the retailer (usually referred to as Product Call-off or Cross-dock delivery in this scenario).

✔ **Note:** This instruction will always include GTIN-level information.

- Manufacturer will instruct the warehouse/DC what (and how many) to pick (**outbound management**).

✔ **Note:** This instruction will always include GTIN-level information.

- The manufacturer DC may consolidate multiple Product Call-offs (a.k.a. Deliveries) into larger shipments (to gain transportation benefits).
  - Once shipments have been created in the DC systems, the DC will send appropriate Transport instructions to the transport provider assigned to each shipment **(transport management)**.
  - Transport provider may confirm the Transport instruction will be executed as requested **(transport management)**.
  - Transport provider may arrange for a Pick-up request with the manufacturer warehouse. Warehouse may then confirm the Pick-up request **(transport pick-up operations)**.
  - Transport provider may arrange for a Drop-off request with the retailer cross-docking point. Cross-docking point may then confirm the Drop-off request **(transport drop-off operations)**.
  - Goods are despatched in shipments from the manufacturer warehouse via the transport provider to the retailer cross-docking point. These shipments will carry the correct labels (GS1 Logistics Labels) to enable transportation by transport provider and receipt by the retailer cross-docking point.
  - Upon Despatch of the shipments, the manufacturer warehouse may send a Despatch Notification to the retailer business unit systems **(inbound/outbound operations)**.
  - A copy of this Despatch Notification usually (but not always) is sent from the retailer business unit systems to the cross-docking point to inform him of the inbound shipment to ease and speed up the receipt process at the cross-docking point **(inbound management)**.
-  **Note:** Depending on Pre-Allocated versus Break-Bulk operations the information in the message sent to the cross-docking point will contain only “delivery”-level (Pre-Allocated operations) information or will also include GTIN-level information (Break-Bulk operations).
- During the execution of Transportation, the manufacturer may request at any time the (latest) status of the shipment **(transport management)**.
  - The transport provider may at any point send (latest) status of the shipment to the manufacturer. This may be in response to the request received from Manufacturer but the transport provider may also initiate the transfer of this information based on schedules agreed with the manufacturer **(transport management)**.
  - Upon delivery of the shipment, the transport provider will always provide the manufacturer with the Final Transport Notification that contains the agreed details on the delivery made – including any exceptions **(transport management)**.
  - The retailer’s cross-docking point may also send a Receipt Notification to the retailer business unit systems **(inbound management)**.
-  **Note:** Depending on Pre-Allocated versus Break-Bulk operations the information in the message sent from the cross-docking point will contain only “delivery”-level (Pre-Allocated operations) information or will also include GTIN-level information (Break-Bulk operations).
- The retailer business unit systems may (but do not have to) also send the Cross-dock Receipt confirmation to the manufacturer **(inbound/outbound operations)**.
-  **Note:** This message should always include GTIN-level information.

#### Most common variations

##### Common variation 1: Break-Bulk operations

If the cross-docking point provides Break-Bulk services the retailer and the cross-docking point need to exchange Item-Master (GTIN-level) information prior to as well as during the execution of any break-bulk services. The diagram above does not include any message to synchronise Item-Master information between manufacturer, retailer and cross-docking point. Prior to execution, all GTIN-

numbers and associated attributes relevant for the Break-bulk operations (e.g., batch/lot control requirements) need to be exchanged. During execution (in this part of the process Receiving from manufacturer) the cross-docking point needs to capture and send GTIN-numbers and quantities as well as (when required) batch/lot control information.

Common variation 2: The manufacturer handles Transport Management himself.

In that case, the **transport management module** will extend between manufacturer business unit and transport service provider.

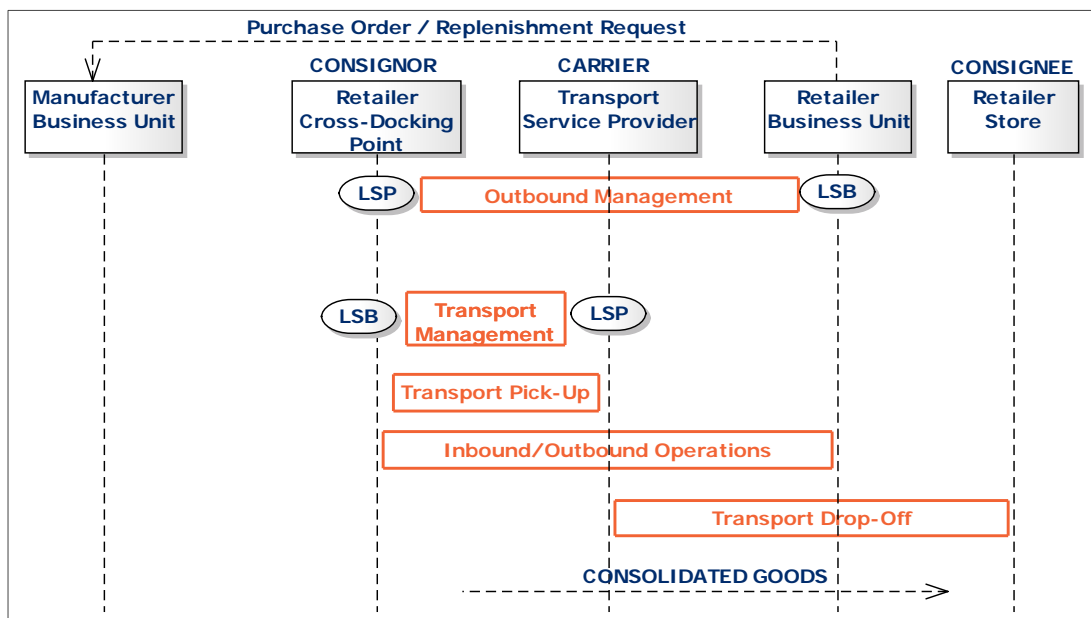
Common variation 3: Manufacturer operates the DC himself.

In that case, the **outbound module** may not be necessary as Order-management and warehouse Management may be handled in the same IT-system.

#### 4.4.4.2 Transport from the cross-docking point into the retailer store

Below diagram describes the information exchanges related to the movements from the cross-docking point into the retailer store.

**Figure 4-13** Transport from the cross-docking point into the retailer store



The sequence of events is as follows:

- Cross-docking point will ship goods to the retailer store based on any type of Demand/Pull signal received from the retailer business unit



**Note:** If Cross-docking point provides Pre-Allocated operations only then this instruction will contain "delivery"-level information only. If the cross-docking point provides Break-Bulk services then this instruction will always include GTIN-level information.

- The retailer may instruct the cross-docking point to consolidate multiple deliveries from multiple manufacturers in a single Store-delivery – shipment (**outbound management**)
- Once shipments have been created in the cross-docking point systems the he will send appropriate Transport instructions to the transport service provider assigned to each shipment (**transport management**).
- Transport provider may confirm the Transport instruction will be executed as requested (**transport management**).
- Transport provider may arrange for a Pick-up request with the cross-docking point. Cross-docking point may then confirm the Pick-up request (**transport pick-up operations**).

- Transport provider may arrange for a Drop-off request with the retailer store. The retailer store may then confirm the Drop-off request (**transport drop-off operations**).
- ✔ **Note:** This task is hardly ever managed through EDI-transactions. Nearly always, the transport provider and retailer store will arrange things through fax/phone/e-mail (if at all).
- Goods are despatched in shipments from the cross-docking point via the transport provider to the retailer store. These shipments will carry the correct labels (GS1 Logistics Labels) to enable transportation by transport provider and receipt by the retailer store.
- ✔ **Note:** Next to the labels in most cases there will also be a Pack-list despatched with the goods to enable the retailer store to check/sign-off receipt of the shipment. The Pack-list will always show GTIN-level information. In the case of Pre-Allocated operations at the cross-docking point, the retailer business unit systems will need to “print” those and make those available to the cross-docking point for the shipments.
- Upon Despatch of the shipments, the cross-docking point may send a Despatch Notification to the retailer business unit systems (**inbound/outbound operations**).
- A copy of this Despatch Notification may be sent from the retailer business unit systems to the retailer store to inform him of the inbound shipment to ease and speed up the receipt process at the retailer store (**inbound/outbound operations**).
- ✔ **Note:** This message should always contain GTIN-level information.
- During the execution of Transportation, the cross-docking point may request at any time the (latest) status of the shipment (**transport management**).
- The transport provider may at any point send (latest) status of the shipment to the cross-docking point (**transport management**). This may be in response to the request received from manufacturer but the transport provider may also initiate the transfer of this information based on schedules agreed with the cross-docking point.
- Upon delivery of the shipment, the transport provider will always provide the cross-docking point with the Final Transport Notification that contains the agreed details on the delivery made – including any exceptions (**transport management**).
- The retailer business unit systems may send the Receipt Notification to the cross-docking point (**inbound/outbound operations**).
- ✔ **Note:** If cross-docking point provides Break-Bulk services this message should include GTIN-level information. If cross-docking point provides Pre-Allocated operations, only this message will contain “Cross-dock delivery”-level information only.
- The retailer store may also send a copy of the Receipt Notification to the retailer business unit (**inbound operations**).
- ✔ **Note:** This message should always contain GTIN-level information.

#### Most common variations

##### Common variation: Break-Bulk operations

If the cross-docking point provides Break-Bulk services the retailer and the cross-docking point need to exchange Item-Master (GTIN-level) information prior to as well as during the execution of any break-bulk services

The diagram above does not include any message to synchronise Item-Master information between retailer and cross-docking point



Prior to execution, all GTIN-numbers and associated attributes relevant for the Break-bulk operations (e.g., batch/lot control requirements) need to be exchanged.

During execution (in this part of the process Pick and Despatch) the cross-docking point needs to capture and send GTIN-numbers and quantities as well as (when required) batch/lot control information.

#### 4.4.5 Returns of RTI from retailer to manufacturer or pallet-Pool

Reusable Transport Items (RTI) are returned to the manufacturer DC by the carrier, immediately after he has delivered the goods. This can happen in a one to one exchange at the point of delivery or the consignee administrates an account for the manufacturer or LSP and they return the RTI when they are no longer required. Another way is if there are specialised LSP (such as CHEP) who are instructed for the return of RTI, for example in a pallet pool.

The most common model/approach for handling returns of reusable transport items is for the retailer site/store to give the RTI to the transport service provider when this transport service provider is delivering Goods as part of a delivery-shipment (See other sections in this chapter for detailed descriptions of how delivery-shipments can be managed). These are also known as the unannounced RTI-returns.

In the case of the unannounced return of RTI the process runs as follows

- The retailer store gives the RTI to the transport service provider.
- The transport service provider records relevant information about this return such as number and type of RTI, estimated volume and weight. These may later be used to charge for the Transportation of the RTI.
- Transport service provider will deliver the RTI to the destination (usually manufacturer site).
- Manufacturer will record receipt of these RTI to update the inventory of RTI in his Site/warehouse.
- Transport service provider and manufacturer may exchange transport instruction and/or Transport instruction response messages to prepare their systems for the financial settlement related to this return-shipment of RTI.

A much less common variation involves the retailer notifying the (specialised) transport service provider in advance that RTI need to be picked-up and returned.

In the case of the pre-announced return of RTI, the process runs as follows:

- The retailer store/warehouse informs the retailer business unit that RTI need to be picked up.
- The retailer business unit will send a Transport instruction to the specialised transport service provider to notify them of the need for pick-up. Information usually limited to high-level totals such as total number to be picked-up per RTI-type.
- The transport service provider collects the RTI from retailer store/warehouse.
- Retailer store/warehouse confirms to retailer business unit the despatch of the RTI.
- Transport service provider will deliver the RTI to the destination (usually the nearest pallet-pool depot; sometimes another participant retailer/manufacturer in the pallet-pool).
- Destination will record receipt of these RTI to update the inventory of RTI in his site/warehouse.



**Remark:** RTI (due to their value) may need to be tracked individually. This applies in some environments in the beverages industry (e.g., kegs for beer).

In that case, each of the information exchanges and activities listed above need to capture exactly which individual RTI is involved in it.

#### 4.4.6 Returns of goods from retailer DC to manufacturer DC

**Returns of finished goods may occur at two different points in time**



1. Goods may be refused when they are being delivered at the retailer store/warehouse for any number of reasons (e.g., goods not ordered, goods damaged). This scenario is normal daily business. In most cases, the party that delivers the goods also returns the goods.
2. Goods may be returned from the retailer after the delivery has been accepted. This may occur if goods fail a quality control (QC) check that takes place within the retailers store/warehouse. It may also occur if goods (such as magazines) were delivered with the express prior agreement they could be returned if not sold.

Returns of finished goods to the manufacturer may occur with prior notification from the retailer to the manufacturer (e.g., goods failing QC-checks).

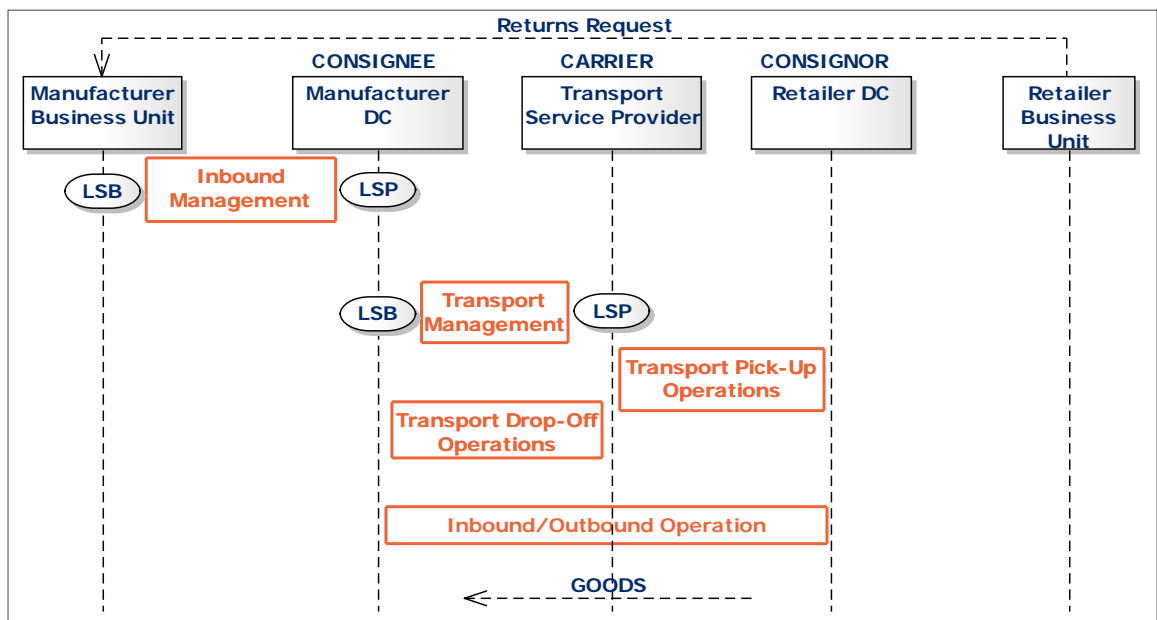
In most cases, returns of finished goods will occur without prior notification (e.g., refusals of –parts of- shipments by retailer store/warehouse).

In the case of unannounced Returns the standard approach is:

- The transport service provider doing the delivery immediately takes back the unannounced Returns.
- ✔ **Note:** This may be a refusal but it may also be a number of (sealed) RTI containing a number of finished goods that is unknown at the moment when they are returned (e.g., magazines returned).
- The transport service provider creates records in his systems with regard to the Returns.
- The transport service provider provides shipment-information related to the return of goods to the manufacturer. This may be a Transport instruction or a Transport Status Notification (**transport management**)
- The transport service provider delivers the Goods Returned to the manufacturer warehouse.
- The manufacturer records the receipt of the Returned Goods in his systems to update Inventory (as well as in preparation for financial settlement regarding the Goods Returned).


In the case of pre-announced Returns the standard approach is:

**Figure 4-14** Returns of goods from retailer DC to manufacturer DC (pre-announced)



The sequence of events is as follows:

- Retailer agrees with manufacturer that goods may be returned (usually reference-numbers for returns authorisation will be determined and exchanged).

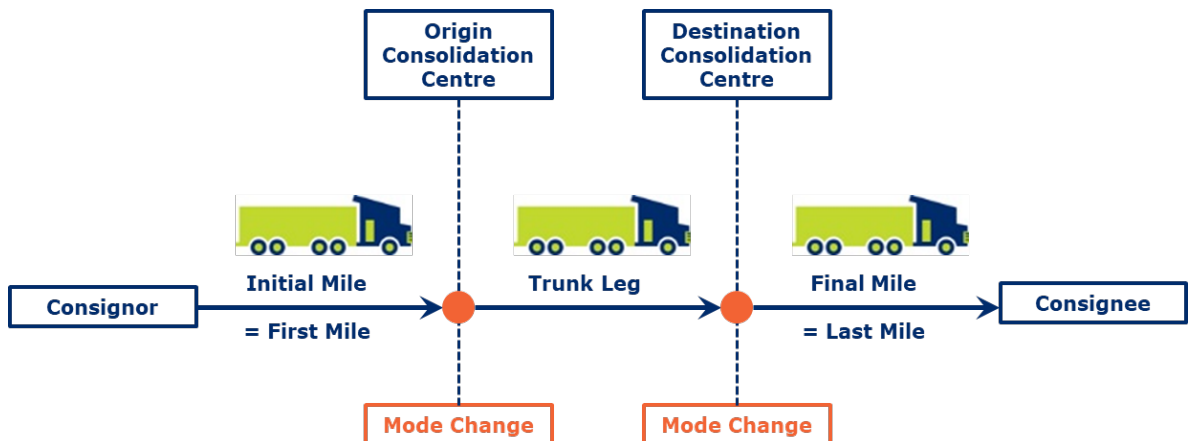
- Manufacturer will instruct the warehouse what goods (and how many) of each will be returned **(inbound management)**.
  - Once shipments to enable the Pick-up of the goods returned from the retailer have been created in the systems of the manufacturer DC he will send appropriate Transport instructions to the transport provider assigned to each shipment **(transport management)**.
  - Transport provider may confirm the Transport instruction will be executed as requested **(transport management)**.
  - Transport provider may arrange for a Pick-up request with the retailer DC. Warehouse may then confirm the Pick-up request **(transport pick-up operations)**.
  - Transport provider may arrange for a Drop-off request with the manufacturer DC. Warehouse may then confirm the Drop-off request **(transport drop-off operations)**.
  - Goods are collected in shipments from the retailer DC via the transport provider to the manufacturer DC. These shipments will carry the correct labels (GS1 Logistics Labels) to enable transportation by transport provider and receipt by the manufacturer DC.
  - Upon Despatch of the shipments, the retailer DC will send a Despatch Notification to the manufacturer DC **(inbound/outbound operations)**.
  - During the execution of Transportation, the manufacturer may request at any time the (latest) status of the shipment **(transport management)**.
  - The transport provider may at any point send (latest) status of the shipment to the manufacturer. This may be in response to the request received from manufacturer but the transport provider may also initiate the transfer of this information based on schedules agreed with the manufacturer **(transport management)**.
  - Upon delivery of the shipment, the transport provider will always provide the manufacturer DC with the Final Transport Notification that contains the agreed details on the delivery made – including any exceptions **(transport management)**.
-  **Note:** Although the manufacturer DC is the recipient of the Goods Returned, the transport service provider will – as a rule – send confirmation of delivery to the manufacturer DC for all shipments, since the DC acts as the LSC for the transport.
- The manufacturer DC will send a Receipt Confirmation for Goods Returned to the manufacturer **(Inbound Management)**.
  - The manufacturer business unit records the receipt of the returned goods in his systems to update Inventory (as well as in preparation for financial settlement regarding the goods returned).

#### 4.5 Transport managed by freight forwarders

In freight forwarding, three main scenarios exist to handle/manage the shipments.

1. The Freight Forwarder is responsible for planning and monitoring execution only. In this scenario, the freight forwarder never actually handles the Goods. The carriers selected by the Freight Forwarder will execute all handling and execution whilst the Forwarder retains responsibility for overall monitoring and management. This model is sometimes referred to as 4PL.

Figure 4-15 4PL



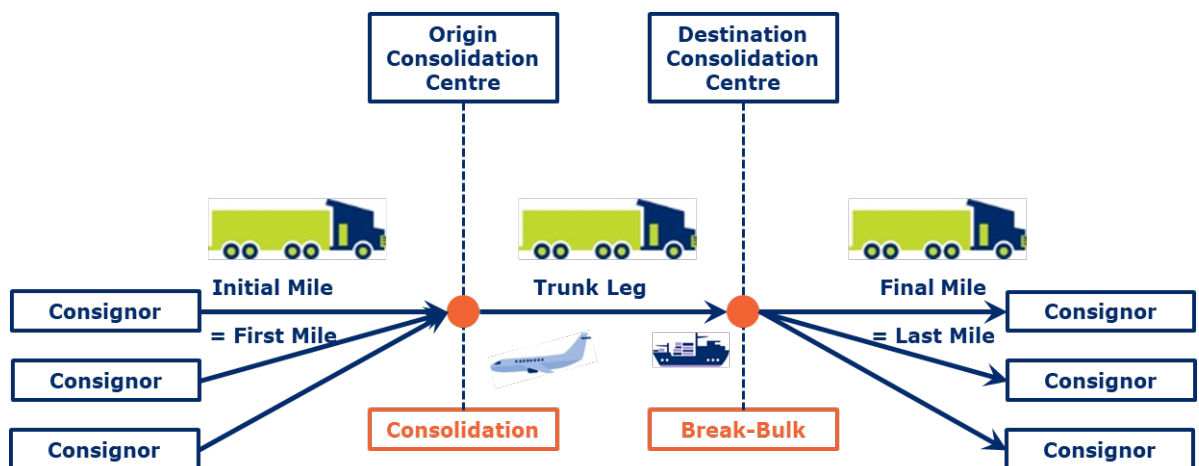
In addition, when goods (Full Truck Loads) are moved directly from Consignor to Consignee, under responsibility of a Freight Forwarder, this is considered a 4PL scenario.

Figure 4-16 Direct FTL Transportation



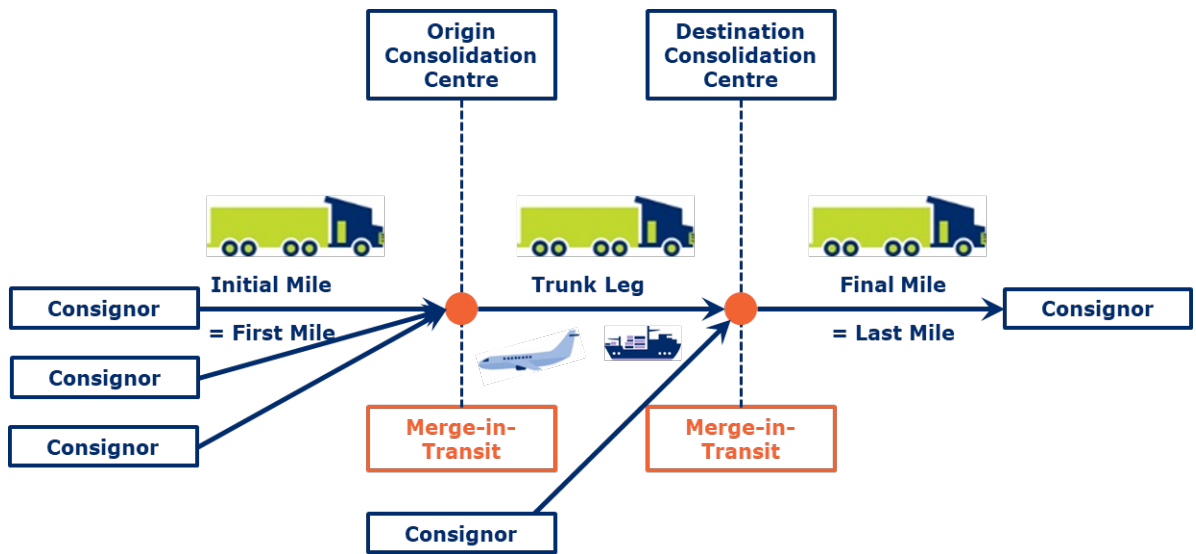
2. The Freight Forwarder also physically handles the goods in a Consolidation Centre. The Freight Forwarder may receive many (small) shipments from a number of his LSC. Freight forwarder may arrange for the transport pick-up and delivery to his consolidation centre. He will then consolidate these into so-called bulk-consignments. Usually the delivery-point for these bulk-consignments is the forwarders (de)consolidation centre closest to the final delivery point. The Forwarder will then assign the individual small shipments to “final-mile” carriers that will execute the delivery to final consignee for these shipments. This model is by far the most common model in (Global) Forwarding and is generally known as Consolidation and Break-Bulk operations.

Figure 4-17 Consolidation and Break-bulk



3. The Freight Forwarder may also be responsible for ensuring that a number of small shipments from different sources (that may be scattered widely geographically) to be delivered in a single drop-off to the final consignee. For the Freight Forwarder all shipments are linked to a single buyer. This model is also known as Merge-In-Transit (MIT).

**Figure 4-18 Merge-In-Transit (MIT)**



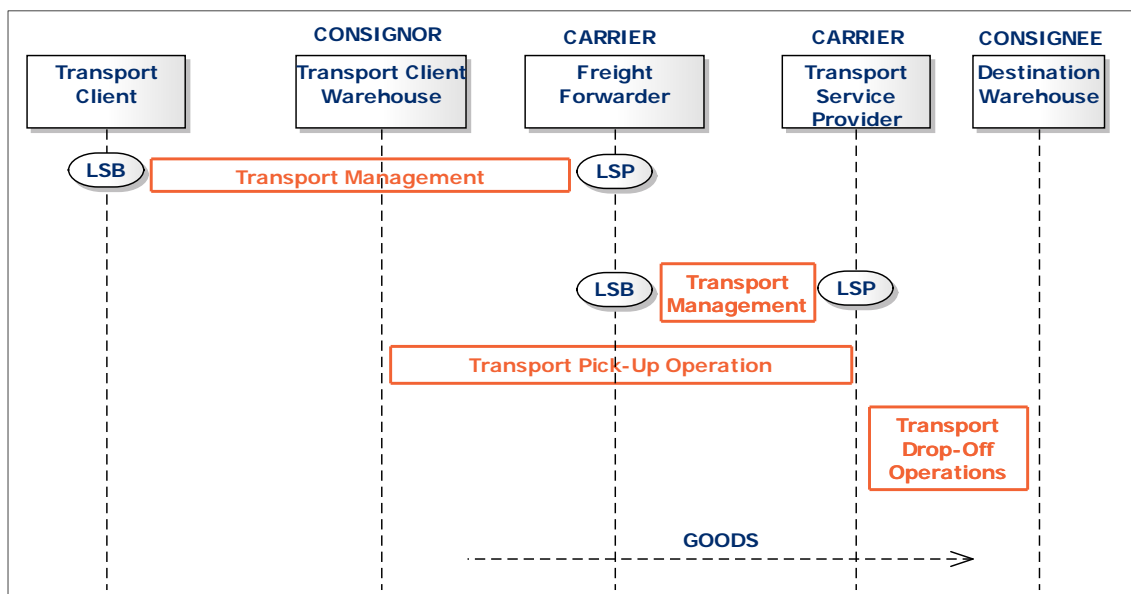
✔ **Note:** All scenarios assume that the forwarder and carrier/s handle entire shipments and/or Transport Units only. These parties have no interest in GTIN-level information unless it is important to select appropriate transportation/carriers e.g., hazardous classes, temperature control information may be required but not individual GTIN-numbers.

#### 4.5.1 Forwarder is responsible for planning and monitoring only (4PL)

In this scenario, the freight forwarder never actually physically handles the Goods. The Freight Forwarder will select appropriate Carriers for each of the shipments that the Forwarder has assembled and then “book” these shipments with the assigned Carrier. The Carriers selected by the Freight Forwarder will perform all handling and execution whilst the Forwarder retains responsibility for overall monitoring and management.

In this scenario, the Freight Forwarder will usually not (be able to) consolidate multiple Transport instructions received from the Transport Buyer. Nearly always the Forwarder simply books the Transport instruction (as received from the Buyer) with the Carrier.

**Figure 4-19 Forwarder is responsible for Planning and Monitoring only (4PL)**



The sequence of events is as follows:

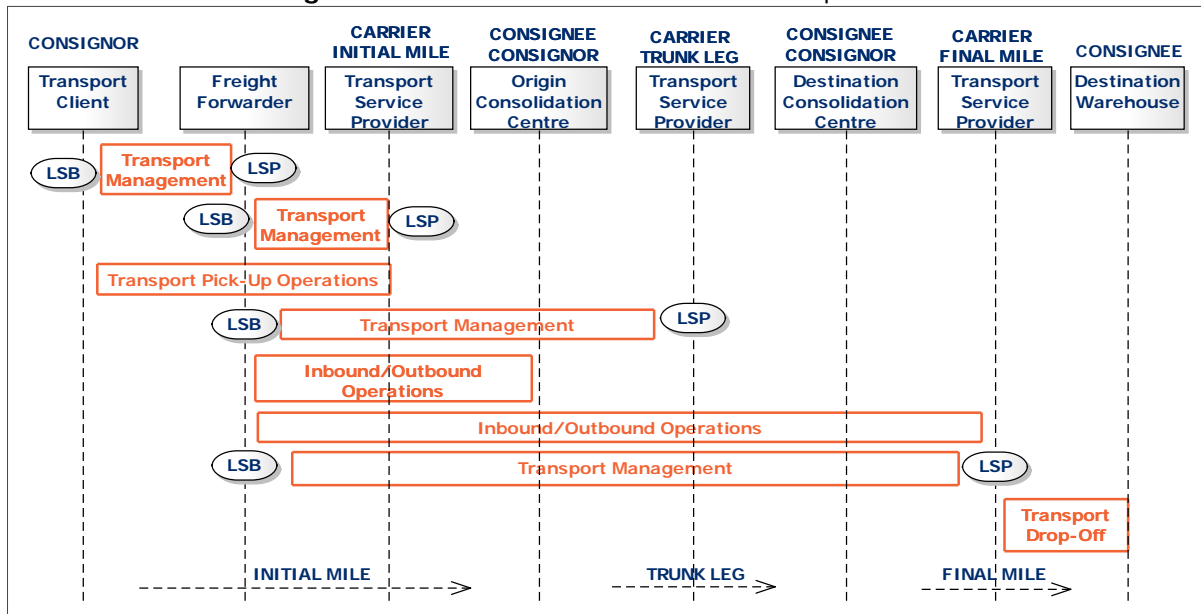
- Once shipments have been created in Transport Buyers systems, the Transport Buyer will send appropriate Transport instructions to the Freight Forwarder (transport provider) assigned to each shipment **(transport management)**.
- Freight Forwarder may confirm the Transport instruction will be executed as requested **(transport)**.
- Freight Forwarder will create consignments in his IT-system/s (based on Transport instruction received from his Buyer) and assign the appropriate Carrier to each of these consignments.
- Once shipments have been created in Forwarders systems, the Forwarder will send appropriate Transport instructions to the Carrier (transport provider) assigned to each consignment **(transport management)**.
- Carrier may arrange for a Pick-up request with the Transport Buyers warehouse **(transport pick-up)**. Warehouse may then confirm the Pick-up request **(transport pick-up)**.
- Carrier may arrange for a Drop-off request with the Consignee's warehouse **(transport drop-off)**. Consignee's warehouse may then confirm the Drop-off request **(transport drop-off)**.
- Goods are despatched in consignments from the Transport Buyers warehouse via the Carrier to the Consignee's warehouse. These consignments will carry the correct labels (GS1 Logistics Labels) to enable transportation by Carrier and receipt by the Consignee's warehouse.
- During the execution of Transportation, the Forwarder may request at any time the (latest) status of the consignment from the Carrier **(transport)**.
- The Carrier may at any point send (latest) status of the consignment to the Forwarder **(transport)**. This may be in response to the request received from the Forwarder but the Carrier may also initiate the transfer of this information based on schedules agreed with the Forwarder.
- During the execution of Transportation, the Transport Buyer may request at any time the (latest) status of the shipment from the Forwarder **(transport)**.
- The Forwarder may at any point send (latest) status of the shipment to the Transport Buyer **(transport)**. This may be in response to the request received from the Transport Buyer but the Forwarder may also initiate the transfer of this information based on schedules agreed with the Transport Buyer.

#### 4.5.2 Consolidation and break-bulk operations.

This model is by far the most common model in (Global) Forwarding. In this mode, the freight forwarder also physically handles the goods in a cross-dock (or Consolidation/Break-Bulk Centre). The Freight Forwarder may receive many (small) shipments from a number of his Logistics Service Buyers (LSC) or Transport Buyers.

The Freight Forwarder may arrange for the transport pick-up from the Transport Buyers site and delivery to the Forwarders consolidation centre. This is sometimes referred to as *"initial mile" transportation*. The Forwarder will then consolidate these many small shipments into so-called bulk-shipments and assign the most appropriate carrier to the bulk-shipments. The assigned carrier then executes these shipments. Usually the delivery-point for these shipments is the Forwarders deconsolidation (Break-Bulk) centre closest to the final delivery point for each of the (small) shipments in the bulk-shipment. This part of the transportation chain is often called the *"trunk-leg"*. The Forwarder will then assign the individual small shipments to *"final-mile" carriers* that will execute the delivery to final consignee for these shipments.




Below diagram illustrates the main interactions between the parties involved in this scenario.

**Figure 4-20** Consolidation and Break-Bulk operations


In general, the module **Transport Pick-up Operations** and the module **Transport Drop-off Operations** will not be used for shipments arriving at or shipped from the Freight Forwarders Consolidation Centres (Origin and Destination in above diagram). In some cases however it may make sense to implement these modules even in this scenario (e.g., if forwarder uses an external agent to operate a Consolidation Centre for him).

The sequence of events is as follows:

- Once shipments have been created in Transport Buyers systems, the Transport Buyer will send appropriate Transport instructions to the Freight Forwarder (transport provider) assigned to each shipment (**transport management**).
- Freight Forwarder may confirm the Transport instruction will be executed as requested (**transport**).
- Freight Forwarder will create shipments in his IT-system/s (based on Transport instruction received from his Buyer) and assign the appropriate Carrier to each of these shipments.
- Once shipments have been created in Forwarders systems, the Forwarder will send appropriate Transport instructions to the Initial Mile Carrier (transport provider) assigned to each shipment (**transport management**).
- Initial Mile Carrier may arrange for a Pick-up request with the Transport Buyers warehouse (**transport pick-up**). Warehouse may then confirm the Pick-up request (**transport pick-up**).
- Initial Mile Carrier might (but most likely will not) arrange for a Drop-off request with the Freight Forwarders Origin Consolidation Centre (**transport drop-off**). Origin Consolidation Centre may then confirm the Drop-off request (**transport drop-off**).
- Goods are despatched in shipments from the Transport Buyers warehouse via the Initial Mile Carrier to the Origin Consolidation Centre. These shipments will carry the correct labels (GS1 Logistics Labels) to enable transportation by Carrier and receipt by the Origin Consolidation Centre.
- Freight Forwarder may provide information about the shipments expected to arrive at the Origin Consolidation Centre to that Consolidation Centre (**Inbound operations**).
- The Origin Consolidation Centre may confirm receipt of the shipments to the Freight Forwarders IT systems (**Inbound – shipments**).
- Freight Forwarder will create shipments in his IT-system/s (based on Transport instruction received from his Buyers) and assign the appropriate Carrier to each of these shipments.

- 
**Note:** These may be direct shipments from Origin Consolidation Centre to consignee warehouse but in this scenario, the assumption is that the Forwarder creates bulk-shipments that contain multiple Transport instructions received from multiple different Buyers of the Forwarder.
  
- Once bulk-shipments have been created in Forwarders systems, the Forwarder will send appropriate Transport instructions to the Trunk-Leg Carrier (transport provider) assigned to each shipment **(transport management)**.
  - The Forwarder will also instruct the Origin Consolidation Centre exactly which original Transport instruction received from the Buyer need to be consolidated into which bulk-consignment **(outbound – consignments)**.
  - The Trunk-Leg Carrier might (but most likely will not) arrange for a Pick-up request with the Origin Consolidation Centre **(transport pick-up)**. Consolidation Centre may then confirm the Pick-up request **(transport pick-up)**.
  - The Trunk-Leg Carrier might (but most likely will not) arrange for a Drop-off request with the Freight Forwarders Destination Consolidation Centre **(transport drop-off)**. Destination C-dock may then confirm the Drop-off request **(transport drop-off)**.
  - Bulk-consignments are despatched from the Freight Forwarders Origin Consolidation Centre via the Trunk-Leg Carrier to the Destination Consolidation Centre. These shipments will carry the correct labels (GS1 Logistics Labels) to enable transportation by Carrier and receipt by the Destination Consolidation Centre.
  - Freight Forwarder may provide information about the bulk-consignments and shipments within that are expected to arrive at the Destination Consolidation Centre to that Consolidation Centre **(Inbound – consignments)**.
  - The Destination Consolidation Centre may confirm receipt of the bulk-consignments and shipments within to the Freight Forwarders IT systems **(Inbound – consignments)**.
  - Freight Forwarder will then create delivery-shipments in his IT-system/s (based on Transport instruction received from his Buyers) to deliver the individual shipments received from the Buyers warehouse/s and assign the appropriate Carrier to each of these shipments.
  
- 
**Note:** Most of the time these deliveries will be a single original shipment received from the Buyers warehouse. In many cases, however multiple original shipments may be combined into a single delivery to the Consignee warehouse/site.
  
- Once delivery-shipments have been created in Forwarders systems, the Forwarder will send appropriate Transport instructions to the Final-Mile Carrier (transport provider) assigned to each delivery **(transport management)**.
  - The Forwarder will also instruct the Destination Consolidation Centre exactly which original shipments received from the Buyer need to be consolidated into which delivery-shipment **(outbound – shipments)**.
  - The Final-Mile Carrier might (but most likely will not) arrange for a Pick-up request with the Destination Consolidation Centre **(transport pick-up)**. Destination Consolidation Centre may then confirm the Pick-up request **(transport pick-up)**.
  - The Final-Mile Carrier may arrange for a Drop-off request with the Consignee warehouse/site **(transport drop-off)**. Consignee warehouse/site may then confirm the Drop-off request **(transport drop-off)**.
  - Freight Forwarders Destination Consolidation Centre will despatch delivery-shipments via the Final-Mile Carrier to the Consignee warehouse/site. These shipments will carry the correct labels (GS1 Logistics Labels) to enable transportation by Carrier and receipt by the Consignee warehouse/site. Freight Forwarder may provide information about the delivery-shipment to the Consignee warehouse/site. Buyer may provide information about the original Buyer-shipments to the Consignee warehouse/site to ease and speed-up receipt-process for delivery-shipments.
  
- 
**Note:** Neither flow is included in diagram above.



- During the execution of any part of the Transportation (Initial-Mile, Trunk-Leg or Final-Mile) the Forwarder may request at any time the (latest) status of the shipment from the Carrier assigned to that part of the Transportation (**transport management**).
- The Carrier may at any point send (latest) status of the shipment or bulk-consignment to the Forwarder (**transport management**). This may be in response to the request received from the Forwarder but the Carrier may also initiate the transfer of this information based on schedules agreed with the Forwarder.



**Note:** This applies to Initial Mile, Trunk-Leg as well as Final Mile Carriers.

- During the execution of Transportation, the Transport Buyer may request at any time the (latest) status of the shipment from the Forwarder (**transport management**).
- The Forwarder may at any point send (latest) status of the shipment to the Transport Buyer (**transport management**). This may be in response to the request received from the Transport Buyer but the Forwarder may also initiate the transfer of this information based on schedules agreed with the Transport Buyer.

### 4.5.3 Merge-In-Transit operations.

This model is an extension of the Consolidation model in Forwarding. In this model, the Freight Forwarder is responsible for ensuring that a number of small shipments from different sources (that may be scattered widely geographically) will be delivered in a single drop-off to the final consignee.

This model imposes quite a few additional demands on the contents of the Information exchanges that occur in the Consolidation/Break-bulk model. The detailed description below will focus on the differences with previous section only. For the description of the main flows in [Consolidation/Break-bulk](#) please see section 4.5.2.

The diagram that illustrates the main interactions between the parties involved in this scenario looks identical to that included in section 4.5.2.

The main difference between this model and all other Forwarder models is that in this model the Forwarder is expected to handle a number of individual original Buyer shipments in relation to each other.

Forwarding in general is concerned with managing single Buyer shipments through the Transportation network. Each shipment has a single "Pick-up point/Consignor" and a single "Drop-off point/Consignee". Each of these shipments is planned completely independently of all other shipments.

Any consolidation of these individual shipments occurs on an "opportunistic" basis. That means that individual original Buyer shipments are combined purely because they happen to be in the same place at the same time and share the same next destination.

In the MIT-model both the Buyer and the Forwarder need to have a predetermined plan of exactly which original shipments need to be shipped when and delivered together BEFORE any shipments leave one of the Buyer warehouses from which the individual shipments originate. The Buyer usually refers to a plan like this as the Merge-In-Transit Order; the Forwarder usually refers to a plan like this as a coordinated shipment-plan.

- The Buyer creates a Merge-In-Transit in his IT-systems. This identifies exactly which products will be shipped in which quantities from which Buyer warehouse/site and to which final consignee (including the planned due-date for delivery).
- Buyer will instruct the warehouses/sites involved to prepare the appropriate component shipments that the Forwarder will need to take charge of as part of the Merge-In-Transit Order.
- Once the Merge-In-Transit Order has been created in Transport Buyer s systems the Transport Buyer will send appropriate Transport instruction to the Freight Forwarder (transport provider) assigned to manage the execution of the Merge-In-Transit Order (**transport management**).



**Note:** The Transport instruction sent to the Forwarder needs to hold all the necessary information about the individual "Pick-up points/Consignors" and "Drop-off



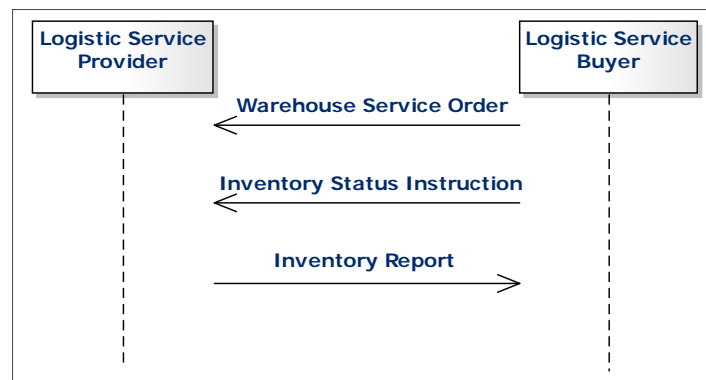
point/Consignee” as well as the information required to “link” these together into a Merge-In-Transit Order. In effect, the Transport instruction looks like “shipment” with multiple Consignors and a single Consignee.

- The Forwarder will decide the most appropriate points in the transportation network for combining/consolidating the individual component-shipments into the single delivery-consignment to consignee.
- ✔ **Note:** Consolidation/Merge-point may be at Origin Consolidation Centre and/or at Destination Consolidation Centre.
- Based on Merge-point decided above Freight Forwarder will create shipments in his IT-system/s and allocate and inform the appropriate Carrier for each of these shipments.
- ✔ **Note:** This will include all related Initial-Mile, Trunk-Leg and Final-Mile shipments.
- The Freight Forwarder will instruct the Consolidation Centre to merge and send specific original component-shipments (if appropriate according to the coordinated shipment-plan). (**Outbound – shipments**)
- The Forwarder will instruct the Destination Consolidation Centre exactly which inbound shipments (either received as-is from the Buyer or already merged at Origin) need to be consolidated into the delivery-consignment. Only after all component shipments have been consolidated the delivery to the final consignee can be made (**Outbound – shipments**).
- ✔ **Note:** If all component-shipments have already been merged at Origin then the delivery-shipment will consist of the single merged shipment received from the Origin Consolidation Centre. However, in most MIT-cases more than one shipment will be merged at this point.

## Warehousing scenarios

The scenarios in this chapter use a limited set of transactions, as displayed in the diagram below.

Figure 4-21 Warehousing scenarios



### 4.5.4 Inventory Management

#### 4.5.4.1 Inventory Status Management

Inventory status management is the process whereby the LSC requests modification of the status of the goods handled by the LSP.

The management of inventory status can be request-based or based on predefined rules.

- The LSC requests the status change.

- The LSP changes the status in his Inventory Management system.
- The LSP reports the status change back to the LSC.

#### 4.5.4.2 Inventory Status Reporting

The exchange of Inventory Status information is necessary to align administrative and physical stock levels between trading partners. It is used periodically, i.e. the report is sent regularly in agreement with the partners. Besides the stock levels, a breakdown per item code/stock status/batch-lot code/logistics unit code may be provided.

There is no instruction from the logistics service buyer, the warehouse service provider will send the Inventory Status information regularly. Stock status may include blocked, available for sale, in quarantine, expired.

- ✔ **Remark:** Inventory Status information may also be reported based on a request, for example in the process of stock reconciliation. In that case, the Logistics Service Buyer will manually request a stock status report.

#### 4.5.4.3 Inventory Activity Reporting

The recording of movements and adjustments and their reporting towards the Logistics Service Buyer offers a faster and more reliable visibility of the available stocks. Inventory Activity refers to all events that modify quantitatively and/or qualitatively the stock level or status: Receipts, despatches and miscellaneous movements (change in state, physical relocation of a traceable item, stock correction, re-palletise, scrapping ...).

The Inventory Activity information may be requested by the LSC and reported back by the LSP (ad hoc report).

The Inventory Activity information may also be triggered by the LSP. In that case, the reporting will be either event driven or happen at predefined intervals (e.g., daily).

#### 4.5.5 Services

This paragraph describes additional activities that are not always part of the regular 3<sup>rd</sup> party warehouse operations. Usually these services will be ordered separately by the LSC and they may also be invoiced separately by the LSP.

##### 4.5.5.1 Re-palletisation

Re-palletisation occurs when goods are separated from the transport items (e.g., pallets) that carry them, and recombined onto new transport items.

- ✔ **Note:** Re-palletisation should not be confused with repacking operations.

The Logistics Service Buyer will send to the warehouse service provider a warehouse service order containing the instruction to re-palletise.


- ✔ **Remark:** For traceability purposes, it is important that the LSP preserves the link between the old and the new SSCC.

##### 4.5.5.2 Quality inspection

This scenario refers to quality inspections performed by the LSP upon request of the LSC. These types of inspections may be required in case of suspected quality issues.

The sequence of events is as follows:

- The LSC will request to perform the quality inspection.
- The LSP performs the quality inspection and reports the results.

-  **Remark:** Traceability is a quality management tool. It is part of an approach incorporating progress and thoroughness. When a defective product slips through quality controls, traceability makes it possible to trace the cause of the malfunction and to take the necessary corrective action.

#### 4.5.5.3 Product recall

Product recall is the tracing, reclaim and collection of products in case of product defects. In the case of product recall, two levels of responsibility can be distinguished:


- **Primary responsibility:** Typically importers, producers, processors, manufacturers, or distributors and food retailers who are responsible for the specification and content of products, withdrawal and/or recall and notification. They are each responsible within the limits of the activities under their control.
- **Secondary responsibility:** Typically transporters, carriers, ship owners, storage companies, and logistics providers who work on behalf of the companies with primary responsibility. However, those with secondary responsibility must create, capture, record and share data about their activities.

Product recalls should not be limited to serious incidents. Traceability may also be regularly employed for minor defects (poorly affixed labels, which damage the brand image, competition coupons where each one is erroneously a winner, less than ideal taste of a batch of bottles of a certain vintage after a few years, etc.).

The sequence of events is as follows:

- The LSC will instruct the 3<sup>rd</sup> Party warehouse about the products that have to be recalled. Usually this is for specific product batches or lots.
- Based on his internal administration the LSP should be able to get hold of the deliveries of these specific products in order to collect them.

Collection (return and transport) may be initiated by the warehouse Service Provider or by the LSC himself (manufacturer, supplier).

-  **Remark:** Traceability systems based on the GS1 system will benefit from the unique identification of items, logistics units and locations. Each party will record the links between logistics units (SSCC) and goods (GTIN + batch/lot).

## Appendix A: Glossary of terms

Please refer to the [www.gs1.org/glossary](http://www.gs1.org/glossary) for the latest version of the glossary.

Name	Acronym	Definition	Source
ADR	ADR	The European Agreement concerning the International Carriage of Dangerous Goods by Road	[6]
Bill of lading	BoL	<p>A document which evidences a contract of carriage by sea and the taking over or loading of goods by the carrier, and by which the carrier undertakes to deliver the goods against surrender of the document. A provision in the document that the goods are to be delivered to the order of a named person, or to order, or to bearer, constitutes such an undertaking. The document has the following functions:</p> <ol style="list-style-type: none"> <li>1. A receipt for goods, signed by a duly authorised person on behalf of the carriers.</li> <li>2. A document of title to the goods described therein.</li> <li>3. Evidence of the terms and conditions of carriage agreed upon between the two parties.</li> </ol> <p><b>Note:</b> Generally, two types are distinguished.</p> <ol style="list-style-type: none"> <li>1. House BOL are issued by the Forwarder.</li> <li>2. Master BOL are issued by the Carrier. They can cover multiple House BOL</li> </ol>	
Booking		In transport: The process of making a reservation for space on a means of transport for the movement of goods.	
Break-bulk		<p>Break-Bulk is the process that deals with splitting up (deconsolidating) a consolidated shipment into multiple different parts.</p> <p>In general, the resulting parts (within forwarding and transportation scenarios) will be the shipments that were originally incorporated into the consolidated shipment.</p> <p>In some break-bulk scenarios, however, even the original shipments will be split up (usually based on SKU).</p> <p>In all cases, the resulting parts from break-bulk may be consolidated again into shipments for the next destination from the Consolidation Centre.</p>	
Business Unit		Organisational unit that serves a defined external market and is responsible for strategic planning and commercial operations. Large companies are often composed of a number of business units.	
Buyer		Party to which goods or services are sold.	
Carrier		The party that provides freight transportation services or a physical or electronic mechanism that carries business information.	[7]
Consignee		The party by whom the goods, cargo or containers are meant to be received. The actual physical receipt can take place by another party.	
consignment		A grouping of logistic or transport units assembled by a freight forwarder or carrier to be transported under one transport document (e.g., waybill)	[7]
Consignor		<p>The party by whom the goods, cargo or containers are sent. The physical despatch can be done by another party. Synonym: Shipper.</p> <p><b>[alternative]</b> Person or firm (usually the seller) who delivers a consignment to a carrier for transporting it to a consignee (usually the buyer) named in the transportation documents. Ownership (title) of the goods remains with the consignor until the consignee pays for them in full.</p>	
Consolidation		The grouping together of individual consignments of goods into a combined consignment for transport.	
Consolidation Centre		<p>The site (location) where the consolidation process is supported and executed by the Logistics Service Provider.</p> <p>Synonym: Logistics Hub</p>	

Name	Acronym	Definition	Source
Cross-docking		The concept of packing products on the incoming shipments so they can be easily sorted at intermediate warehouses or for outgoing shipments based on final destination. The items are carried from the incoming vehicle docking point to the outgoing vehicle docking point without being stored in inventory at the warehouse. Cross-docking reduces inventory investment and storage space requirements. Synonym: direct loading.	<b>[APICS]</b>
Customer		The party that receives, buys, or consumes an item or service.	<b>[7]</b>
Customs		The Government Service, which is responsible for the administration of Customs law and the collection of duties and taxes and which also, has the responsibility for the application of other laws and regulations relating to the importation, exportation, movement or storage of goods.	<b>[5]</b>
Customs brokerage		<p>Customs Brokerage is a profession that involves the 'clearing' of goods through customs barriers for importers and exporters (usually businesses). This involves the preparation of documents and/or electronic submissions, the calculation (and usually the payment) on behalf of the buyer of taxes, duties and excises, and facilitating communication between the importer/exporter and governmental authorities. However, custom brokers (sometimes known as customs agents) can also become involved in a multitude of complex customs and legal issues.</p> <p>Customs brokers are predominantly employed by freight forwarders, but may be independent businesses or may be employed by shipping lines, importers, exporters, governments, trade authorities and customs broking firms.</p>	<b>[Wiki]</b>
Dangerous goods		Goods that are classified as being hazardous, especially when they are to be transported, according to the applicable regulation for the mode of transport used for the carriage, e.g., United Nations Dangerous Goods (UNDG) classification number.	
Delivery		The physical process of handing over goods to the consignee or to the party acting on his behalf.	
delivery note		The delivery note is the commercial paper document, which integrates the information about the goods and which can be returned signed to the consignor.	
Direct delivery		The conveyance of goods directly from the vendor to the buyer without intermediate storage or unnecessary delay in the distribution activities. Frequently used if a third party acts as intermediary agent between the supplier and buyer.	
Distribution Centre	DC	A distribution centre for a set of products is a warehouse or other specialised building, often with refrigeration or air conditioning, which is stocked with products (goods) to be redistributed to retailers, to wholesalers, or directly to consumers.	<b>[WIKI]</b>
Final mile		The transportation related to moving the consignment from the final Consolidation Centre to the Consignee location. The Consignee or the Forwarder may arrange for the execution of Final Mile movement. Synonym: Last Mile	
freight forwarder		The party that arranges the carriage of goods including connected services and/or associated formalities on behalf of the shipper (consignor) or consignee.	<b>[7]</b>
Forwarding		The action of taking care of the despatch or receipt of shipments and the organisation of all transport related issues (e.g., route, mode and means of transport, etc.), taking care of the consolidation of information related to these shipments and their transport, and, in the case of international transport, fulfilling the documentary requirements stipulated by the national body for control of exports/imports and acting as customs clearance agent.	
Forwarding instruction		Instructions from either the seller/consignor or the buyer/consignee to a freight forwarder, carrier or his agent, or other provider of a service, enabling the movement of goods and associated activities. The following functions can be covered:	

Name	Acronym	Definition	Source
		<ul style="list-style-type: none"> <li>■ movement and handling of goods (shipping, forwarding and stowage),</li> <li>■ customs formalities,</li> <li>■ distribution of documents,</li> <li>■ allocation of documents (freight and charges for the connected operations),</li> <li>■ special instructions (insurance, dangerous goods, goods release, additional documents required).</li> </ul> Synonyms: Consignment Instruction, Shipping Instruction	
Freight		<ol style="list-style-type: none"> <li>1. Goods in transport from one location to another.</li> <li>2. The amount of money due for the carriage of goods and payable either in advance or upon delivery.</li> <li>3. The revenue earned from the movement of cargo.</li> </ol>	
Freight costs		Costs incurred when moving goods, by whatever means, from one place to another under the terms of a contract of carriage. In addition to transport costs, this may include such elements as packing, documentation, loading, unloading, and insurance (to the extent that they relate to the freight costs).	
Full truck load	FTL	For operational purposes a full trailer load (FTL) trailer is considered a trailer into which no cargo can be added during the time it is transported.	
Global Location Number	GLN	The GS1 identification key used to identify physical locations or parties. The key comprises a GS1 Company Prefix, location reference, and check digit.	[7]
Global Trade Item Number®	GTIN	The GS1 identification key used to identify trade items. The key comprises a GS1 Company Prefix, an item reference and check digit.	[7]
GS1 Logistics Label		Allows users to identify logistic units uniquely so that they can be tracked and traced throughout the supply chain. The only mandatory requirement is that each logistic unit must be identified with a unique serial number, the Serial Shipping Container Code (SSCC).	
House Waybill Number		A freight forwarder's document used mainly as a control for the goods within the freight forwarder's own service system	[7]
Inbound		Coming in, heading inwards. Used in this model to refer to goods moving into a warehouse.	
Initial mile (in forwarding)		The transportation related to moving the consignment from the Pick-up location to the first Consolidation Centre. The Consignor or the Forwarder may arrange for the execution of Initial Mile movement.	
Less than truck load	LTL	For operational purposes a less than trailer load (LTL) is considered a trailer, which multiple consignments or part thereof are shipped.	
Load (in transport)		Quantity that is being carried, expressed in a fraction of the full load of the transport means or equipment. This term normally refers to transport by truck or train. <b>[note]</b> Above definition is usually referred to as the load-factor. Usually in transportation load is a synonym for consignment.	
Logistics service buyer	LSB	LOGISTICS SERVICE BUYER = The logistics service buyer is defined as the party ordering the logistics services from the logistics service provider and may be either the consignor or the consignee depending on the business scenario	[1]
Logistics service provider	LSP	Party providing logistics services such as warehousing, re-packing products, distribution and assembly. Synonym: Third-party logistics provider (3PL)	
logistic unit		An item of any composition established for transport and/or storage that needs to be managed through the supply chain. It is identified with an SSCC.	[7]

Name	Acronym	Definition	Source
Manufacturer		In the context of this document: Party that produces consumer packaged goods and sells them to retailers.	
Material supplier		In the context of this document: Party that produces materials and sells them to manufacturers.	
Means of transport		The particular vehicle used for the transport of goods or persons.	
Mode of transport		The method of transport used for the conveyance of goods or persons, e.g., by rail, by road, by sea.	
Outbound		Leaving or departing; traveling away from; outward bound. Used in this model to refer to goods moving out of a warehouse.	
Package		The final product of the packing operation consisting of the packing and the contents, e.g., a box, carton, crate, barrel, pallet, etc.	
Packaging		Materials and components used in any packaging operation to wrap, contain and protect articles or substances during transport.	
Packing list		Document specifying the distribution of goods in individual packages.	
Proof of delivery		Document signed by a party receiving goods acknowledging the receipt of goods specified under conditions stated or referred to in the document [note] This document is nearly always issued by the carrier and he uses it as proof of completion of execution of his commitments to his LSC. Document should show at least date and time delivery was made as well as the name and signature of the person who signed for receipt.	
Retailer		A business or person that sells goods to the consumer, as opposed to a wholesaler or supplier, who normally sell their goods to another business.	<b>[8]</b>
Seller		Party selling goods or services.	
shipment		A grouping of logistics and transport units assembled and identified by the seller (sender) of the goods travelling under one despatch advice and/or Bill of Lading to one customer (recipient).	<b>[7]</b>
Shipping instruction		Document providing all details required for the physical movement of a consignment.	
Serial Shipping Container Code	SSCC	The GS1 identification key used to identify logistics units. The key comprises an extension digit, GS1 Company Prefix, serial reference, and check digit.	<b>[7]</b>
trade item		Any item (product or service) upon which there is a need to retrieve predefined information and that may be priced, or ordered, or invoiced at any point in any supply chain.	<b>[7]</b>
Transport		The process of conveying freight from the point of despatch to the point of receipt.	
Transport status		The status of a shipment or group of shipments. For example, in transit, damaged, delayed, or diverted.	
Warehouse		A building specially designed for receipt, storage, material handling, reconditioning and shipping of products.	
Warehousing		The activity of holding and handling goods and/or articles/products and reconditioning the articles forming products in a store (therefore including internal transport within an operational unit).	

## Appendix B: Sources and references

Reference #	Document name	Managing organisation	Version
[1]	Controlled Vocabulary <a href="https://www.unece.org/fileadmin/DAM/uncefact/CCL/CCL17B_ControlledVocabulary.pdf">https://www.unece.org/fileadmin/DAM/uncefact/CCL/CCL17B_ControlledVocabulary.pdf</a>	UN/CEFACT	Version 17B
[5]	Glossary of International Customs Terms <a href="https://www.wto.org/english/thewto_e/minist_e/min96_e/glossary.htm">https://www.wto.org/english/thewto_e/minist_e/min96_e/glossary.htm</a>	World Customs Organization	Nov 2013
[6]	About the ADR <a href="https://www.unece.org/trans/danger/publi/adr/adr_e.html">https://www.unece.org/trans/danger/publi/adr/adr_e.html</a>	UNECE	Jan 2015
[7]	GS1 General Specifications <a href="https://www.gs1.org/genspecs">https://www.gs1.org/genspecs</a>	GS1	Release 18.0
[8]	Business Dictionary <a href="http://www.businessdictionary.com/">http://www.businessdictionary.com/</a>		



## Appendix C: Existing message standards

LIM Transaction	EANCOM®	X12	GS1 XML
Interoperation Settings	This information is not exchanged via a message		
Party Master Data	Party Information (PARTIN)	Organizational Relationships (816)	Not available
Item Master Data	Price/Sales Catalogue (PRICAT)	Item Maintenance (888), Price/Sales Catalogue (832)	Catalogue Item Notification, Item Data Notification
Transport Routing Data	Not available	Request for Routing Instructions (753), Routing Instructions (754)	Not available
Logistics service conditions	Contractual conditions message (CNTCND)	Not available	Purchase Conditions
Warehousing Requirements	Delivery Schedule (DELFOR)	Not available	Goods Requirements, Replenishment Request
Transport Capacity Requirements	Delivery Schedule (DELFOR), Firm booking message (IFTMBF)	Not available	Transport Capacity Requirements
Transport Capacity Plan	Booking confirmation message (IFTMBC)	Not available	Transport Capacity Plan
Transport Capacity Booking	Firm booking message (IFTMBF)	Not available	Transport Capacity Booking
Transport Capacity Booking Confirmation	Booking confirmation message (IFTMBC)	Not available	Transport Capacity Booking Response
Warehouse Inbound Instruction	Arrival notice message (IFTMAN)	Transportation Appointment Schedule Information (163)	Warehouse Inbound Instruction
Despatch Notification Inbound	Despatch Advice (DESADV)	Warehouse Stock Transfer Shipment Advice (943), Ship Notice/Manifest (856)	Despatch Advice
Receipt Notification Inbound	Receiving Advice (RECADV)	Receiving Advice/Acceptance Certificate (861), Warehouse Stock Transfer Receipt Advice (944)	Receiving Advice
Warehouse Inbound Notification		Ship Notice/Manifest (856)	Warehouse Inbound Notification
Warehouse Operations Instruction	Cargo/Goods Handling and Movement (HANMOV)	Warehouse Shipping Order (940)	Warehouse Operations Instruction
Warehouse Operations Notification	Cargo/Goods Handling and Movement (HANMOV)	Warehouse Inventory Adjustment Advice (947)	Warehouse Operations Notification
Inventory Report Request	Inventory Report (INVRPT)	Inventory Inquiry/Advice (846)	Logistics Inventory Report Request
Inventory Report	Inventory Report (INVRPT)	Inventory Inquiry/Advice (846)	Logistics Inventory Report
Warehousing Outbound Instruction	Instruction To Despatch (INSDDES), Cargo/Goods Handling and Movement (HANMOV)	Warehouse Shipping Order (940)	Warehousing Outbound Instruction
Receipt Notification Outbound	Receiving Advice (RECADV)	Receiving Advice/Acceptance Certificate (861)	Receiving Advice



LIM Transaction	EANCOM®	X12	GS1 XML
Warehousing Outbound Notification	Despatch Advice (DESADV)	Warehouse Shipping Advice (945)	Warehousing Outbound Notification
Transport Instruction	Transport Instruction (IFTMIN), Forwarding and Consolidation Summary (IFCSUM)	Motor Carrier Load Tender (204)	Transport Instruction
Transport Instruction Response	Transport Status (IFTSTA)	Response to a Load Tender (990)	Transport Instruction Response
Pick-up Request	Instruction To Despatch (INSDES), Cargo/Goods Handling and Movement (HANMOV)	Motor Carrier Load Tender (204)	Transport Pick-up Drop-off Request
Pick-up Response	Transport Status (IFTSTA)	Response to a Load Tender (990)	Transport Pick-up Drop-off Confirmation
Transport Status Request	Transport Status (IFTSTA)	Motor Carrier Shipment Status Inquiry (213)	Transport Status Request
Transport Status Notification	Transport Status (IFTSTA)	Transportation Carrier Shipment Status Message (214)	Transport Status Notification
Drop-off Request	Instruction To Despatch (INSDES)	Motor Carrier Load Tender (204)	Transport Pick-up Drop-off Request
Drop-off Response	Transport Status (IFTSTA)	Response to a Load Tender (990)	Transport Pick-up Drop-off Confirmation
Final Transport Status Notification	Transport Status (IFTSTA)	Transportation Carrier Shipment Status Message (214)	Transport Status Notification
LSB Statement of Charges	Not available	Not available	Not available
LSP Statement of Charges	Not available	Not available	Not available
Invoice	Invoice (INVOIC)	Freight Invoice (210)	Invoice
Self-billed Invoice	Invoice (INVOIC)	Freight Invoice (210)	Invoice
Remittance Notification	Remittance Advice (REMADV)	Payment Order/Remittance Advice (820)	Settlement

## Appendix D: Original contributors

Organisation	Role in supply chain
DHL Exel Supply Chain	Logistics Service Provider
FM Logistics	Logistics Service Provider
Frigoscandia	Logistics Service Provider
GEFCO	Logistics Service Provider
GEODIS	Logistics Service Provider
Linjegods	Logistics Service Provider
Schenker	Logistics Service Provider
Firmenich	Material Supplier
Henkel	Manufacturer
Nestlé	Manufacturer
Procter & Gamble	Manufacturer
Unilever	Manufacturer
GS1 Czech Republic	GS1 Member Organisation
GS1 France	GS1 Member Organisation
GS1 Germany	GS1 Member Organisation
GS1 Italy	GS1 Member Organisation
GS1 Netherlands	GS1 Member Organisation
GS1 Norway	GS1 Member Organisation
GS1 Poland	GS1 Member Organisation
GS1 US	GS1 Member Organisation
GS1 Global Office	GS1
VICS	Global standard body
UN/CEFACT	Global standard body
TIE	Solution Provider