Logistics Interoperability Model

Version 1

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Disclaimer

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Introduction & Acknowledgements

About this document

The purpose of this report is to describe the Logistics Interoperability Model (LIM) Version 1. This report has been created by the GS1 Logistics Forum where Retailers, Manufacturers, Material Suppliers and Logistic Service Providers are represented.

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

Contributors

Logistic Services Providers:

- DHL Exel Supply Chain
- FM Logistics
- Frigoscandia
- GEFCO
- GEODIS
- Linjegods
- Schenker

Material Suppliers:

- Firmenich

Manufacturers:

- Henkel
- Nestlé
- Procter & Gamble
- Unilever

Organizations:

- GS1 Czech Republic
- GS1 France
- GS1 Germany
- GS1 Italy
- GS1 Netherlands
- GS1 Norway
- GS1 Poland
- GS1 US
- GS1 Global Office
- VICS
- UN/CEFACT

Solution Providers:

- TIE

Executive Summary

Logistic Services Providers play a significant role in today's Consumer Packaged Goods (CPG) supply chain in managing the internal and external goods flows for Retailers, Manufacturers and Material Suppliers. 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 Logistic Service Providers.

Therefore these partners need solutions based on common business processes, common communication and identification solutions to be able 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 take out unnecessary cost of the supply chain.

The foundation for the solution is the development of a framework of common business processes and related data communications interchanges and driving alignment on all levels of these interoperations from master data alignment to financial settlement. This framework is the LIM, the Logistics Interoperability Model. This is the first deliverable of the GS1 Logistics Forum and the basis for further work.

The GS1 Logistics Forum (LF) has the mission to lead the development and drive the implementation of the GS1 Logistics Solutions to achieve business benefits for global supply chains by fostering interoperability between the participants and overcoming barriers of scalability because of different business processes and different formats of data interchanges.

The aim of the Logistics Interoperability Model (LIM) is to establish business interoperability in the Transport and Warehousing business processes. Business interoperability is the capability to run business processes seamlessly across organisational boundaries.

The LIM describes the high level business processes and a comprehensive set of transactions that occur in these processes. The LIM has been developed by the GS1 Logistics Forum, which includes representatives of different parties of the supply chain.

The LIM covers the following business functions;

- Procurement
- Planning
- Warehousing
- Transport
- Financial settlement

Several existing warehouse and transport scenarios and the way the LIM can cope with these practices have been outlined in this report. On top of that the LIM includes some future directions like transactions and messages for Master Data Alignment, Purchase Conditions and planning which is not common business today in interaction with Logistic Service Providers.

In the next stage, a dedicated LIM Work Group will be created in the GS1 Global Standards Management Process (GSMP) to work on the gap-analysis with current GS1 eCOM message standards and the development of necessary enhancements to these standards. Besides that the work will start to enhance the LIM (LIM version 2) with cross continental logistics focusing on transport and customs handling for the relevant transport modes especial air and sea.

SECTION I – THE PROJECT

1. Mission

The GS1 Logistics Forum (LF) has the mission to lead the development and drive the implementation of the GS1 Logistics Solutions to achieve business benefits for global supply chains by fostering interoperability between the participants and overcoming barriers of scalability because of different business processes and different formats of data interchanges.

The scope covers Transport and Warehousing for large enterprises as well as small and medium enterprises (SME's). The aim is to deliver common sets of solutions and to drive GS1 standards implementation cross industry and cross regions.

In the GS1 Logistics Forum retailers, manufacturers, material suppliers and logistic service providers are represented.

2. Rationale

The current reality in the CPG supply chain is that many trading partners, i.e. Retailers, Manufacturers and Material Suppliers are faced with different business processes and data interchanges with their Logistic Service Providers. This becomes even more apparent when they move into more advanced interactions whereas the role of the Logistic Service Providers becomes more and more significant. Different business processes and approaches create a barrier to the scalability and visibility whilst also imposing many extra costs and efforts on the daily operation.

Parties will obtain benefits from more interoperable systems and better scalable solutions leading to more efficiency and transparency of operations and visibility of the flow of goods. 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, developing the standards to support these business processes efficiently and by specifying the semantics of messages exchanged between the organizations to support these business processes in a scalable way.

3. Objective

The logistic partners in the supply chain need global solutions to be able to overcome barriers of scalability and improve visibility.

The foundation for these solutions is the development of a framework of common business processes and related data communications interchanges and driving alignment on all levels of these interoperations from master data alignment to financial settlement. This framework is the LIM, the Logistics Interoperability Model. This is the first deliverable of the GS1 Logistics Forum and the basis for further work.

The LIM describes the high level business processes and a comprehensive set of transactions that occur in these processes. The LIM has been developed by the GS1 Logistics Forum where Retailers, Manufacturers, Material Suppliers and Logistic Service Providers are represented.

The LIM covers the following business functions;

- Procurement
- Planning
- Warehousing

- Transport
- Financial settlement

4. Approach

4.1. EDI Message development

This LIM Version 1 report will be submitted as a Change Request (CR) on the current GS1 eCOM (EDI) standards to the GSMP on behalf of the GS1 Logistics Forum. As this CR will be a Complex CR, a specifically dedicated LIM Work Group will be created in the GSMP through a call-to-action.

The Global Standards Management Process, or GSMP, is the pre-eminent worldwide collaborative forum where GS1 standards are built and maintained.

The Logistics Forum will recommend a prioritisation of the work related to existing eCOM standards (addressing both EANCOM® and GS1 XML). It will also investigate inclusion for solutions for the SME's like eDocs, XML-forms, which are not yet part of the standard

The prioritisation of the work is as follows:

1. Gap-analysis of the proposed LIM transactions to EANCOM® and GS1 XML messages
2. Development of eCOM messages for the parts of the LIM with the highest priority, eg. business need, being first of all Transport and secondly Warehousing .
3. Compilation of an LIM Implementation Guide for Transport and Warehousing.
4. Subsequent gap-analysis and development of messages and enhancement of the LIM-guide with the other blocks; Financial settlement, Master Data Alignment, Logistic Service Conditions and Planning.

The GS1 standards provide an integrated solution for identification of the logistics units, automated data capture and electronic data interchange. Using a standard common approach to the numbering and bar-coding of trade items and logistics units delivers benefits of speed, accuracy and cost savings in the processes of handling and distribution of goods throughout the entire supply chain. These benefits are increased when applying the GS1 identification standards in electronic data interchange.

The benefits include the following:

- Facilitate international supply chain management
- Provide more accurate information on the logistics units, trade items, services and locations
- Reduce manual entry efforts
- Facilitate improved traceability of goods and shipments
- Reduce compliance costs of trading partners

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

GS1 creates international and multi sectorial standards and helps to overcome barriers of international commerce created by national and industry specific standards. In defining the business processes, transactions and standards GS1 aligns with UN/CEFACT standards that already exist or are under development. This ensures further interoperability with trading partners active in other industries

4.2. LIM Version 2

The scope of the LIM Version 1 is basically continental transport. In Version 2 the model will be extended to include cross continental logistics. To enhance the scope cross continents implies more focus on sea and air and also what is called 'single window', the one approach for customs handling.

Another enhancement is the incorporation of Retailers. Not only as active participants in the LIM but also for more detailed requirements also cross continents. Retailer requirements have been taken already in account for LIM Version 1 through the LSP's that work for them.

SECTION II – THE MODEL

1. 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 logistic service providers, incorporating the return of goods (reverse logistics). The focus is on the Consumer Packaged Goods (CPG) supply chain.

The LIM describes common business processes and data interchanges to support interoperability with Logistic 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 to be a value added logistic service (in scope), if the GTIN changes it is considered to be 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

The actual model is composed of business processes or business process blocks, divided into business transactions, These business transactions will be mapped to electronic messages (GS1 eCOM). Relationship between transactions and messages is not by default 1 to 1. Several transactions can be mapped to 1 message. All transactions however will have a specific message implementation guide explaining the use of the message in the context of the business transaction.

The model consists of 7 distinct business processes:

Interoperation Agreement	**Master Data Alignment**	**Logistic Services Conditions**	**Planning**	**Warehousing**	**Transport**	**Financial Settlement**

1.1. Parties and Roles

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

The following generic terms are used to refer to **parties**:

- Retailer
- Manufacturer
- Material Supplier
- Logistic Services Provider (Warehousing and/or Transport)

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

1. Logistic Services Provider (LSP)
2. Logistic Services Client (LSC)

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

3. Consignor
4. Consignee

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

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:

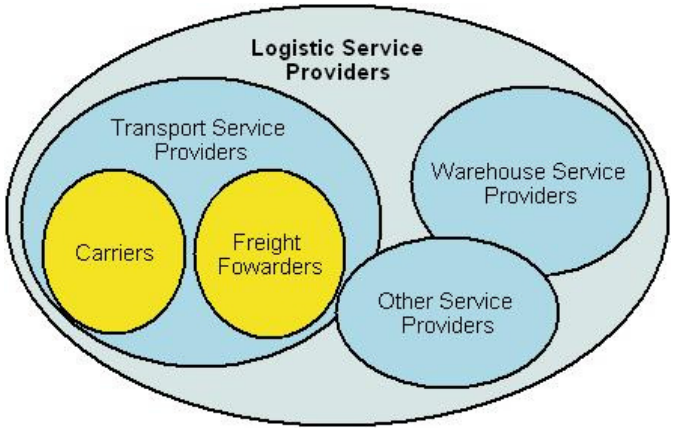
- Inventory Location
- Ship From Location
- Ship to Location.
- Pick-up Location
- Drop-off Location

There are various terms to refer to types of Logistic Services Providers (LSP):

- Transport Service Providers
- Carriers
- Freight Forwarders
- Warehouse Service Providers
- Other Service Providers such as Customs Brokers.

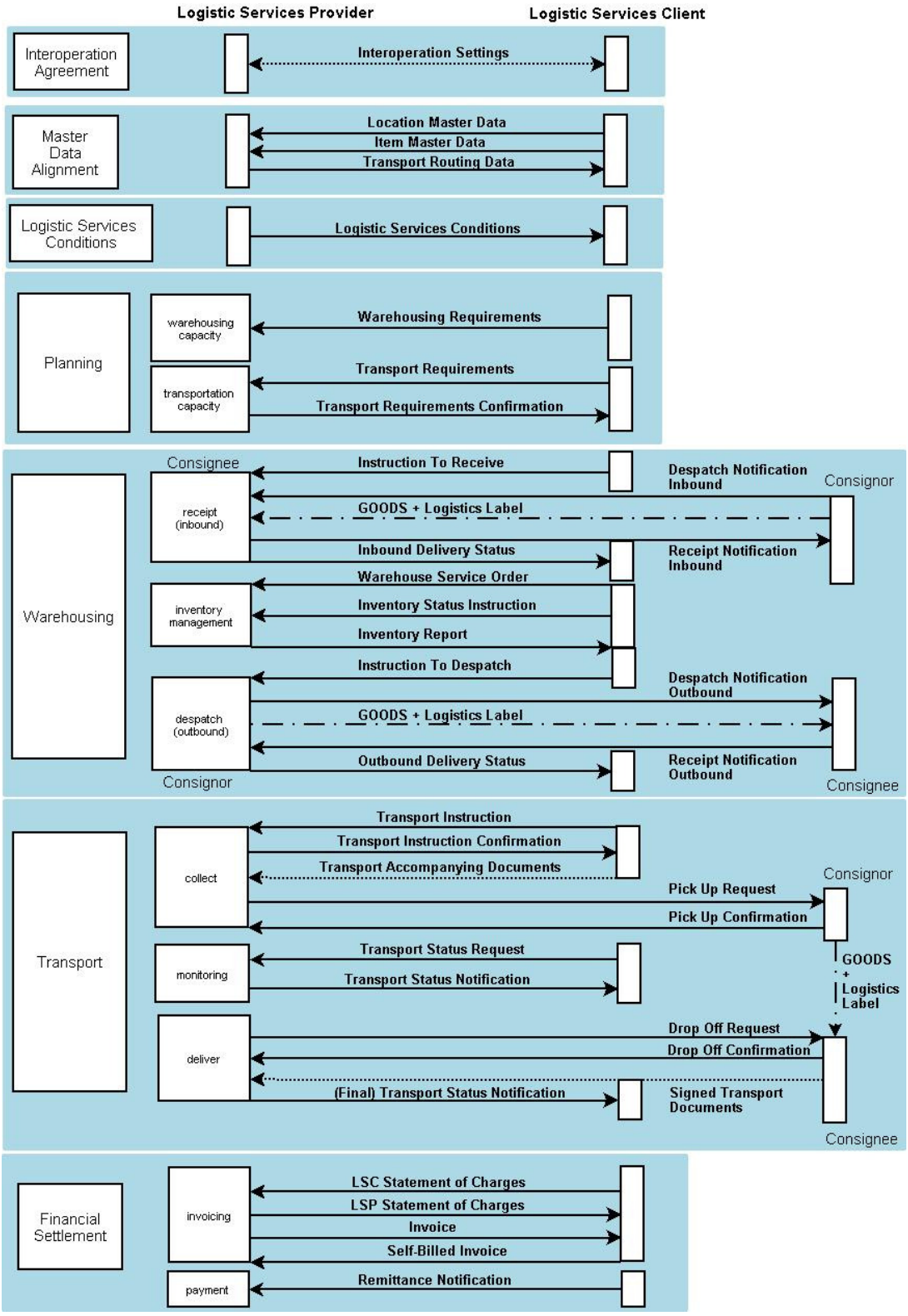
The diagram below illustrates how these terms relate to each other.

Figure 1-1 Types of LSP's



1.2. LIM Overview

Figure 1-2 LIM



2. Interoperation Agreement

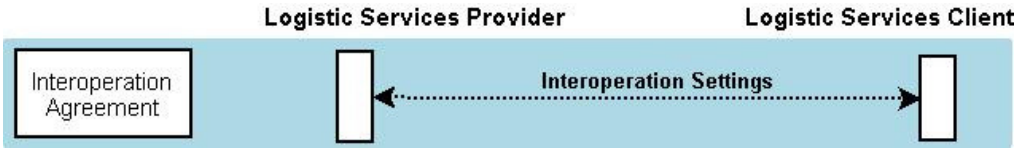
2.1. Scope

Interoperation Agreement	**Master Data Alignment**	**Logistic Services 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 Logistic Services Provider and Client. It contains the following components for which the roles and responsibilities as well as parameters and targets have to be defined: master data management, 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 Logistic Services Provider and Client will occur, including standards used, performance expectations, back-up procedures and data privacy.

2.2. Transactions

Figure 2-1 LIM Interoperation Agreement



2.2.1. 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: Logistic Services Provider and Logistic Services Client 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. Master Data Alignment

3.1. Scope

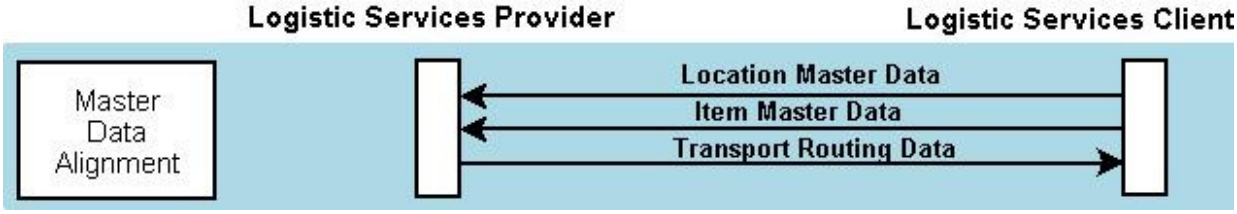
Interoperation Agreement	**Master Data Alignment**	**Logistic Services Conditions**	**Planning**	**Warehousing**	**Transport**	**Financial Settlement**

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. Transactions

Figure 3-1 LIM Master Data Alignment



3.2.1. Location Master Data

Purpose: The Location Master Data transaction enables the alignment and synchronisation of location information between trading partners.

Location 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 Logistic Services Client 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

3.2.2. 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 which 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). In this way data covered in the item master data does not need to be filled in other transactions.

Responsible party: In logistic services scenarios the Item Master Data will be supplied by the Logistic Services Client. The *Item Master Data* will be aligned each time information changes or new information is added.

Response: Not foreseen

3.2.3. 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 Logistic Service Provider –freight forwarder or carrier – will send the transport routing information to the Logistic Services Client. *Transport Routing Data* will be aligned each time information changes or new information is added.

Response: Not foreseen

4. Logistic Services Conditions

4.1. Scope

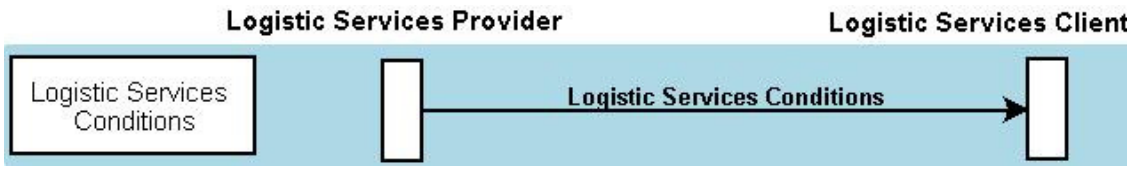
Interoperation Agreement	**Master Data Alignment**	**Logistic Services Conditions**	**Planning**	**Warehousing**	**Transport**	**Financial Settlement**

The Logistic Services Conditions describes the commitment between the logistic service client and the logistic service provider on execution of the agreed service around warehousing, transport or both, for a given period and at the stated rate / price.

The Logistic Services Conditions define the relevant contractual data to be able to invoice the logistic services rendered. It does not intend to cover the totality of the contractual data.

4.2. Transactions

Figure 4-1 LIM Logistic Services Conditions



4.2.1. Logistic Services Conditions

Purpose: The *Logistic Services 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 of time 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 in order to enable the automatic validation of orders and in the verification of invoices prior to payment.

The *Logistics Services 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 Logistic Services Provider on establishment of the contract

Response: Not foreseen

5. Planning

5.1. Scope

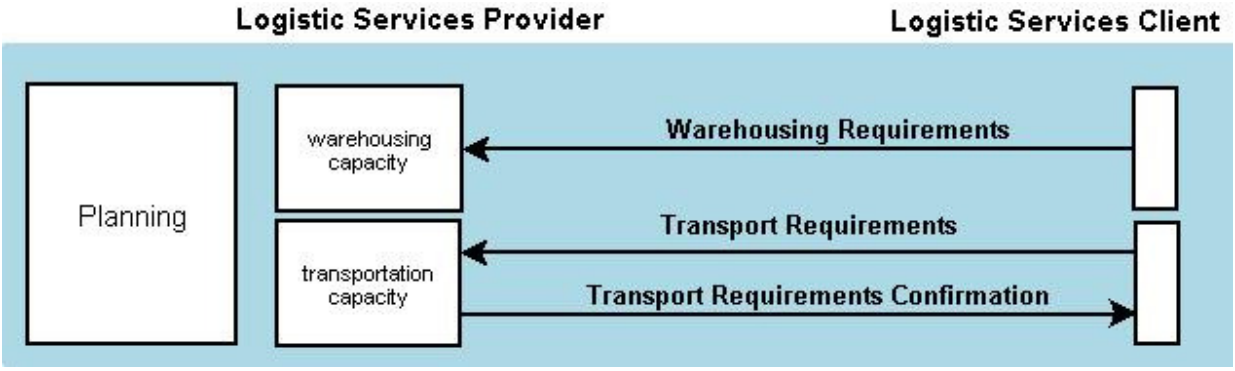
Interoperation Agreement	**Master Data Alignment**	**Logistic Services Conditions**	**Planning**	**Warehousing**	**Transport**	**Financial Settlement**

Planning focuses on future activities in relation to warehousing or transport and aims to ensure capacity for the fulfilment of 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.

5.2. Transactions

Figure 5-1 LIM Planning



5.2.1. 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 Logistic Services 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 Logistic Services Client will monthly and / or weekly communicate the planning information, until the actual demand (shipment) is released to the DC for order picking, packing and loading.

Response: Not foreseen

5.2.2. Transport 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 Logistic Services Client in order to plan transportation capacity demand for the future

Transportation Requirements may include information that will enable the Logistic Services Provider to plan::

- Type and No. of Transport
- Trade-lane (from / to location indicators)
- Available transport Logistic Service Providers
- Anticipated Dates / Period

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

Response: The Logistic Services Provider should confirm if the planned transportation data can or cannot be used for the actual firm transport booking.

5.2.3. Transport Requirements Response

Purpose: To confirm whether the Logistic Services Provider has capacity to deliver all or part of the required transport services.

Trigger: After receipt of the *Transport Requirements* the Logistic Services Provider will calculate whether he can fulfil the requirements and will send a response.

Response: Not foreseen.

6. Warehousing

6.1. Scope

Interoperation Agreement	**Master Data Alignment**	**Logistic Services Conditions**	**Planning**	**Warehousing**	**Transport**	**Financial Settlement**

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

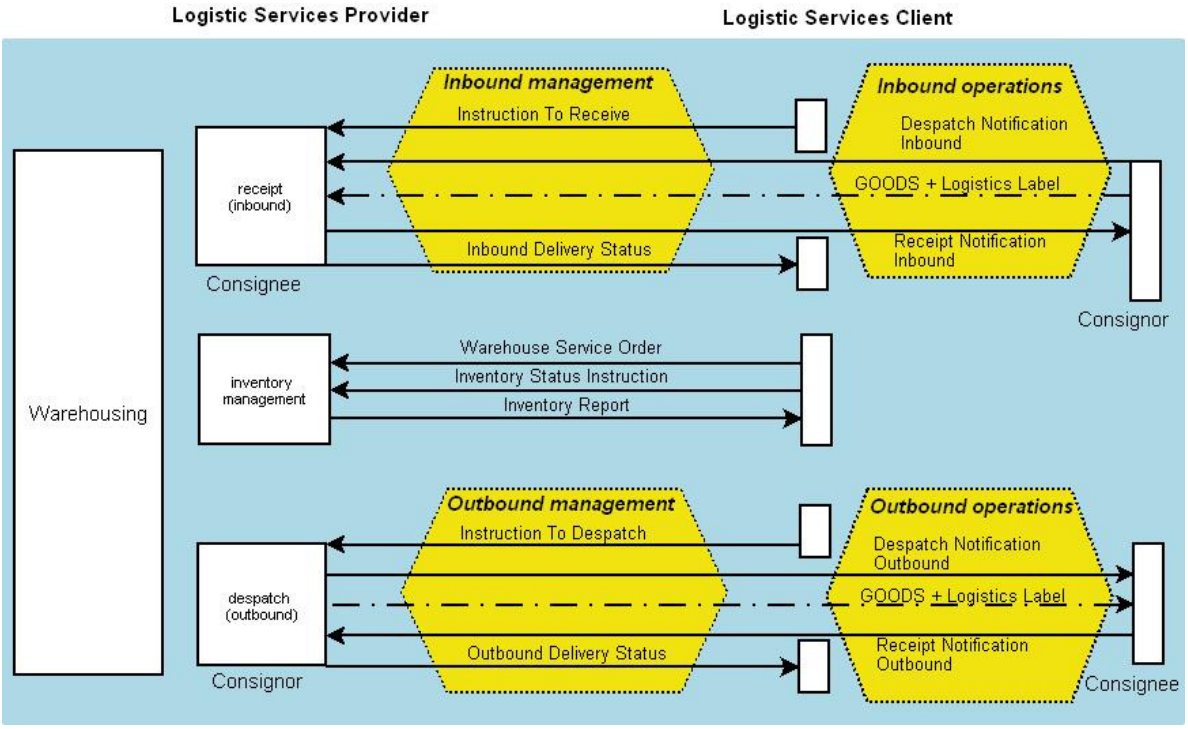
The return flow of products and materials in the supply chain is also included, like product recalls and reverse logistics for empty pallets or crates.

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 to be a value added logistic service (in scope), if the GTIN changes this is considered to be contract manufacturing (out of scope).

6.2. Modules

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

Figure 6-1 LIM Warehousing Modules



The transactions in the next paragraph have been clustered by module: Inbound Management (6.3), Inbound Operations (6.4), Outbound Management (6.5), Outbound Operations (6.6) and Other Transactions (6.7).

6.3. Transactions for Inbound Management

6.3.1. Instruction to Receive

Purpose: Communicate anticipated receipts to the Logistic Services Provider. This will help the LSP to plan required capacity, especially in case the Despatch Notification (provided by the consignor) is absent or received late in the process.

Trigger: Triggered by the Logistic Services Client after he has ordered the goods.

Response: Inbound Delivery Status

6.3.2. Inbound Delivery Status

Purpose: The purpose is for the Logistic Services Provider to inform the logistic services client regarding the status of the inbound delivery. The transaction can be used to communicate discrepancies of the actual receipt versus the information in the *Instruction to Receive*.

Trigger: Triggered by the Logistic Services Provider after he has received the goods.

Response: Not foreseen

6.4. Transactions for Inbound Operations

6.4.1. 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 Logistic Services Provider (Consignee) on shipments (including returns) despatched to him.

Trigger: Triggered by the Consignor at shipment creation.

Response: Receipt Notification

6.4.2. GS1 Logistics Label (Inbound)

Purpose:

Logistic 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 logistic 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 logistic label, and to use it in the further communication, such as the *Receipt Notification*.

6.4.3. Receipt Notification Inbound

Purpose: The purpose of the *Inbound Receipt Notification* is for the Logistic Services 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 and related invoicing.

Trigger: Triggered by the Logistic Services Provider (= Consignee) at receipt of the shipment.

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

6.5. Transactions for Outbound Management

6.5.1. Instruction to Despatch

Purpose: The purpose of the *Instruction to Despatch* 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 and re-pack and label in another package). It does not cover the ordering of transport services.

The information may include:

- Carrier / 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 Logistic Services Client 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.

6.5.2. Outbound Delivery Status

Purpose: The purpose is for the logistic services provider to inform the logistic services client regarding the status of the outbound delivery. Can be used to communicate discrepancies of the actual delivery versus the information in the Instruction to Despatch, based on information from the Despatch Notification and /or Receipt Notification.

Trigger: Triggered by the Logistics Services Provider after despatch of the goods (definitely after sending the *Despatch Notification* to the consignee, possibly after processing the *Receipt Notification* from the consignee).

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

6.6. Transactions for Outbound Operations

6.6.1. 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 on shipments despatched to them.

Trigger: Triggered by the Logistic Services Provider (Consignor) at shipment creation.

Response: Receipt Notification Outbound

6.6.2. GS1 Logistics Label (Outbound)

Purpose:

Logistic 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 logistic units uniquely so that they can be tracked and traced throughout the supply chain.

Trigger:

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

The layout of 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 logistic 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 3.6.2.5 GS1 Logistics Label (Transport).

6.6.3. Receipt Notification Outbound

Purpose: The purpose of the *Outbound Receipt Notification* is for the Consignee to inform the Logistic Services 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 and related invoicing.

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.

6.7. Other Transactions

6.7.1. Warehouse Service Order

Purpose: A client can use an LSP to carry out non customer related value added services on products (e.g. internal movements, re-packing for quality reasons, etc.). The *Warehouse Service Order* may be used to order these services.

Trigger: Triggered by Logistic Service Client at order creation.

Response: Not foreseen

6.7.2. Inventory Status Instruction

Purpose: To carry out a status change of the goods (e.g. from quarantine to free for sale).

Trigger: Triggered by the Logistic Service Client on inventory status change

Response: Not foreseen

6.7.3. Inventory Report

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

Inventory Movement

Purpose: Inventory movements are identified as adjustments of the inventory over a certain period of time (e.g. hour, week, day, month). For each item and location the reported movements over a certain period should match with the reported begin and end status over that same period.

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 Logistic Service Provider at the agreed upon date(s) and time(s) for sending.

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

Inventory Status

Purpose: Inventory status is used to report on the actual inventory at a certain point in time (e.g. hour, week, day, month). All of the reported movements over a certain period should match the changes in the inventory status over that same period. For each item and location the reported begin and end status over a certain period should match with the reported movements over that same period.

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 Logistic Service Provider at the agreed upon date(s) and time(s) for sending.

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

7. Transport

7.1. Scope

Interoperation Agreement	**Master Data Alignment**	**Logistic Services Conditions**	**Planning**	**Warehousing**	**Transport**	**Financial Settlement**

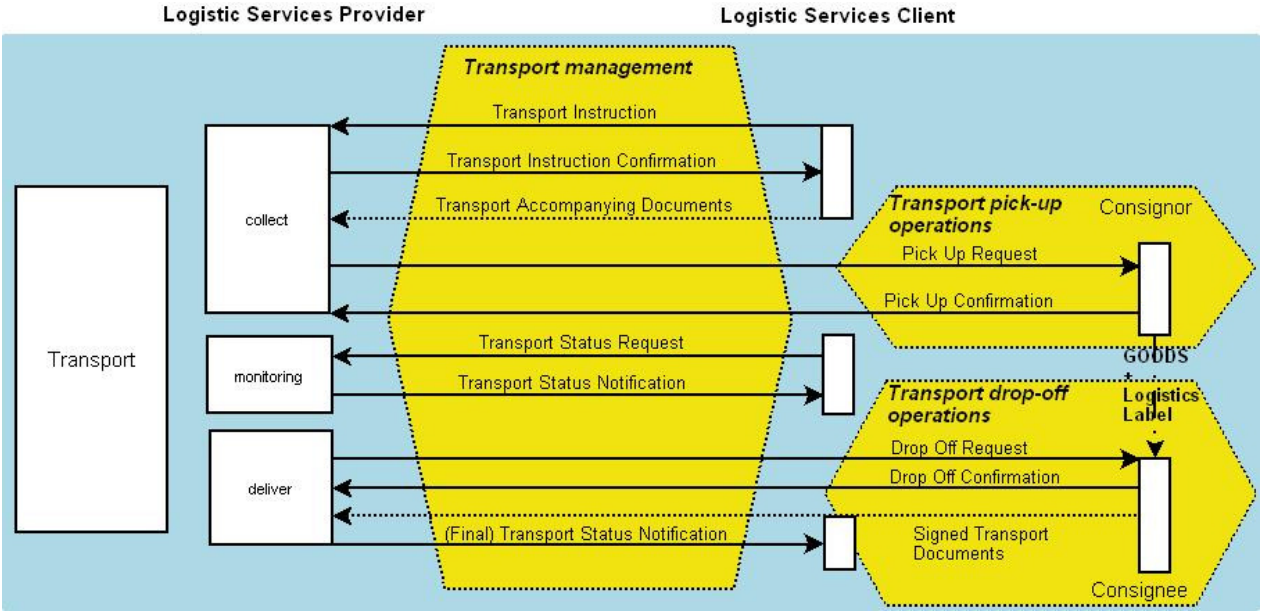
Transport is the movement of goods from factories to warehouses or depots (collection), the movement of goods from warehouses to the customer delivery locations (delivery) and the monitoring of these movements.

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

7.2. Modules

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

Figure 7-1 LIM Transport Modules



The transactions in the next paragraph have been clustered by module: Transport Management (7.3), Transport Pick-up Operations (7.4) and Transport Drop-off Operations (7.5).

7.3. Transactions for Transport Management

7.3.1. 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 the 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 Logistic Services Client (supplier, retailer, 3rd party warehouse or freight forwarder) to a Logistic Services Provider (freight forwarder or carrier) upon order creation.

Response: Transport Instruction Response

7.3.2. 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 Logistic Services Provider (freight forwarder or carrier) to the Logistic Service Client. The transaction will be triggered within the agreed time interval from receipt of the *Transport instruction*.

Response: Not foreseen

7.3.3. 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 Logistic Services Client to the Logistic Services Provider (freight forwarder or carrier) at the agreed upon date and time for sending. Logistic Services Client and Logistic Services Provider need to decide and agree who will be responsible for printing the documents.

Response: Not foreseen.

7.3.4. Transport Status Request

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

Trigger: The *Transport Status Request* will be sent by the Logistic Services Client (who can be the supplier, retailer, 3rd party warehouse or freight forwarder) to the Logistic Services Provider (the carrier). The transaction can be used at any time.

The Logistic Services Client may authorize 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.

7.3.5. Transport Status Notification

Purpose: This transaction enables the transmission of status information by a freight forwarder or carrier, to a 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 status reported (e.g. the identification number of the truck transporting the goods item).

Responsible party: The *Transport Status Notification* will be sent by the Logistic Services Provider to the Logistic Services Client. 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 Logistic Services Client may authorize other parties to have access to the transport status information, such as the consignor or the consignee.

Response: Not available

7.3.6. Final Transport Status Notification

Purpose: This transaction allows to send the final status of the delivery (also known as IOD, Information on Delivery) to the Logistic Services Client.

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 Logistic Services Provider after the delivery.

Response: Not foreseen

7.4. Transactions for Transport Pick-up Operations

7.4.1. 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 Services Provider (carrier) to the Consignor before the pick-up is to take place, exact timing depends on the agreements.

Response: Pick-up Response

7.4.2. Pick-up Response

Purpose: To communicate the pick-up information to the Logistic Services Provider.

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

Response: Not foreseen

7.5. Transactions for Transport Drop-off Operations

7.5.1. 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 info 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 Services Provider (carrier) to the Consignee before the drop-off is to take place, exact timing depends on the agreements.

Response: *Drop-off Response*.

7.5.2. Drop-off Response

Purpose: A transaction to communicate the drop-off information to the Logistic Services 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 Response* to the Logistics Services Provider (carrier).

Response: Not foreseen

7.5.3. Signed Transport Documents

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

The Logistic Services Provider may allow the Logistic Services Client 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 Logistic Services Provider (carrier).

Response: Not foreseen.

7.6. GS1 Logistics Label (Transport)

Purpose:

Logistic 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 logistic units uniquely so that they can be tracked and traced throughout the supply chain.

Trigger:

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

8. Financial Settlement

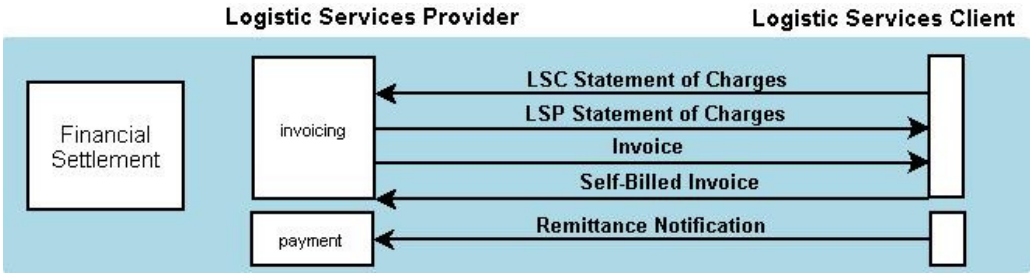
8.1. Scope

Interoperation Agreement	**Master Data Alignment**	**Logistic Services Conditions**	**Planning**	**Warehousing**	**Transport**	**Financial Settlement**

Financial Settlement covers the process from where the services are delivered to the Logistic Services Client to the confirmation of payment by the Logistic Services Provider. Financial settlement takes place based on the actual volumes / weight of the goods serviced, according to the Logistic Service Conditions. Financial settlement mainly differs depending on whether the invoicing process is triggered by the Logistic Services Provider (traditional invoicing) or by the Logistic Services Client (self-billing).

8.2. Transactions

Figure 8-1 LIM Financial Settlement



8.2.1. LSC Freight/Service Statement of Charges

Purpose: The purpose is to instruct the Logistics Service Provider on the detailed charges as calculated by the Logistic Services Client. In both invoicing options, i.e. normal invoicing or self-billing, this information may be used for reconciliation and/or alignment between Logistic Services Client and Logistic Services 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 (customization, 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

Trigger: The Logistic Services Client generates the *Statement Of Charges* monthly and/or weekly depending on the contractual agreement/Interoperation Settings.

Response: Not foreseen

8.2.2. LSP Freight/Service Statement of Charges

Purpose: The purpose is to instruct the Logistics Service Client on the detailed charges as calculated by the Logistic Services Provider. In both invoicing options, i.e. normal invoicing or self-billing, this information may be used for reconciliation and/or alignment between Logistic Services Client and Logistic Services 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 (customization, 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

Trigger: The Logistic Services Provider generates the *Statement Of Charges* monthly and/or weekly depending on the contractual agreement/Interoperation Settings.

Response: Not foreseen

8.2.3. Freight/Service Invoice

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

Trigger: Generated by the Logistic Services Provider monthly and/or weekly depending on the contractual agreement.

Response: Not foreseen

8.2.4. Self-Billed Freight/Service Invoice

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

Trigger: Generated by the Logistic Services Client monthly and/or weekly depending on the contractual agreement.

Response: Not foreseen

8.2.5. Remittance Notification

Purpose: The purpose is for the Logistic Services Client to inform the Logistic Services Provider on the invoices that have been paid.

Trigger: Generated by the Logistic Services Client after the payment has been made.

Response: Not foreseen

SECTION III – THE SCENARIOS

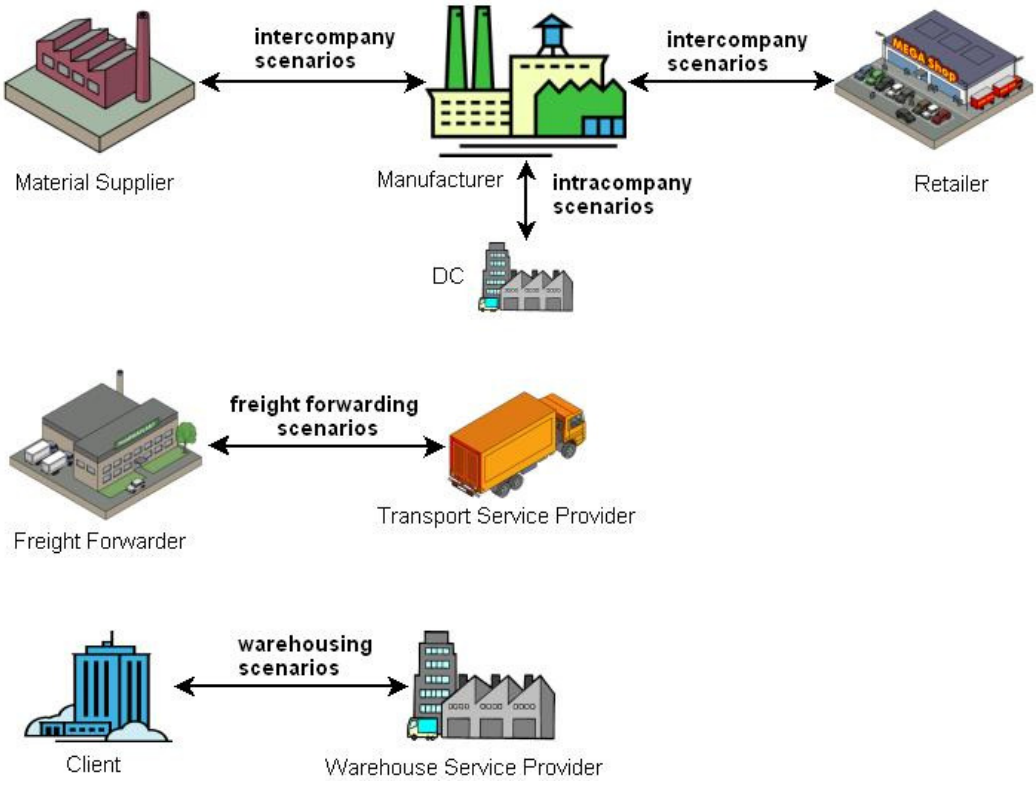
1. Scope

In this section the transport and warehousing processes are analyzed 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 1-1 Overview of scenarios



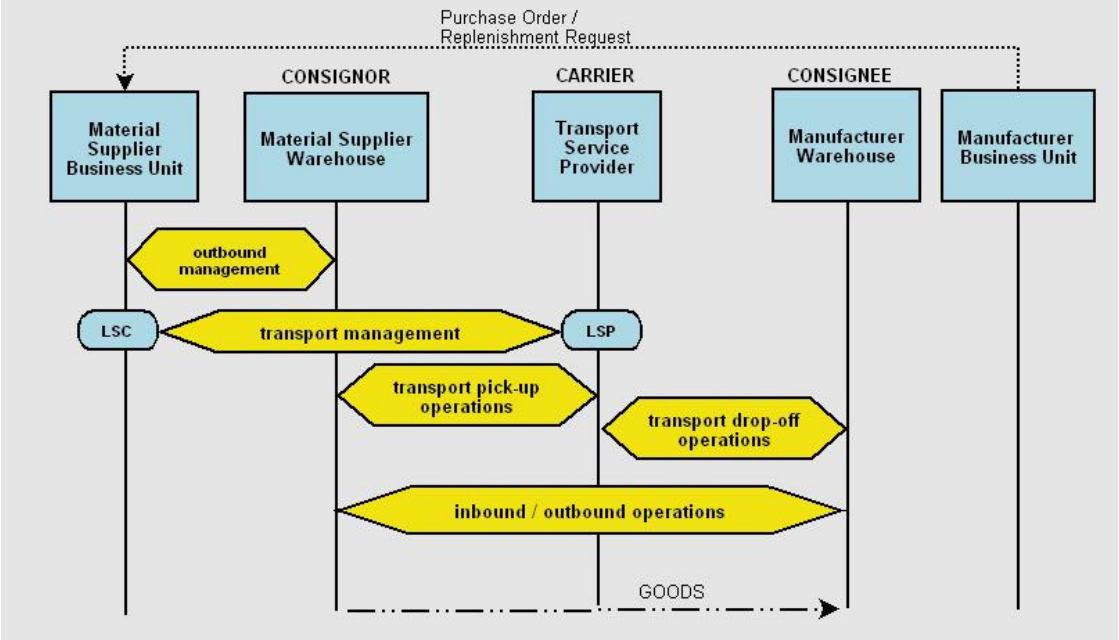
Note: To help define the scenarios in a structured way in the diagrams instead of the individual business transactions the modules are depicted. The sequence of events is captured in the textual description and not in the diagrams. The modular diagrams cannot capture the detailed sequence of the transactions.

2. Scenarios between Material Supplier and Manufacturer

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 2-1 Transport managed by Material 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 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, 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 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 organizes 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.

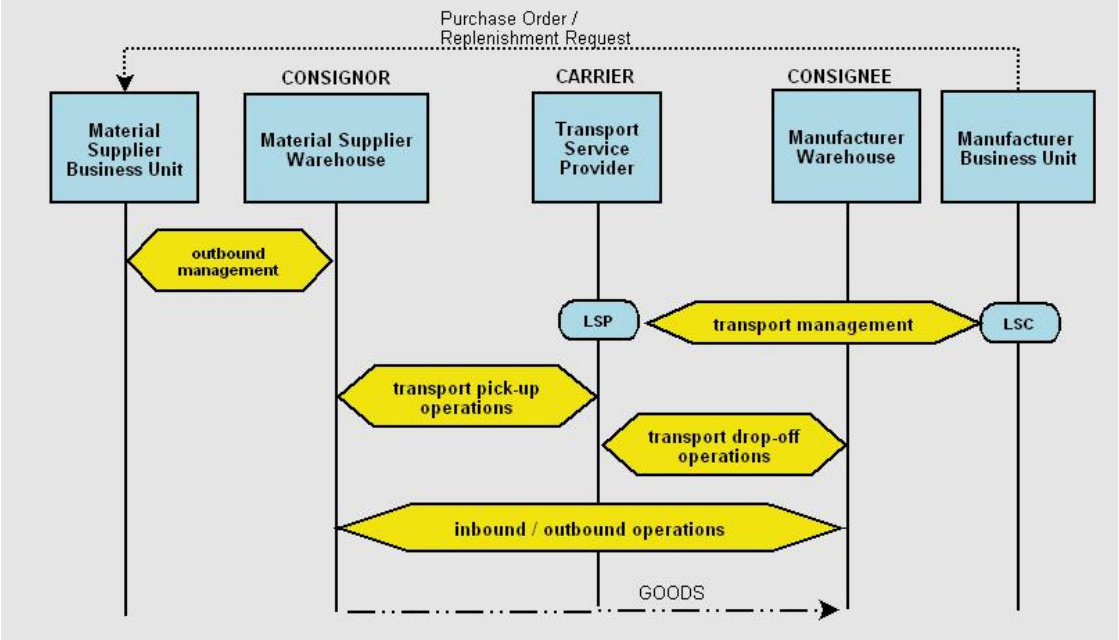
Variation 2: A Warehouse Service Provider can manage the transport on behalf of the Material Supplier. In that case he will act as the LSC in the Transport Management process.

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 2-2 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 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 organizes 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.

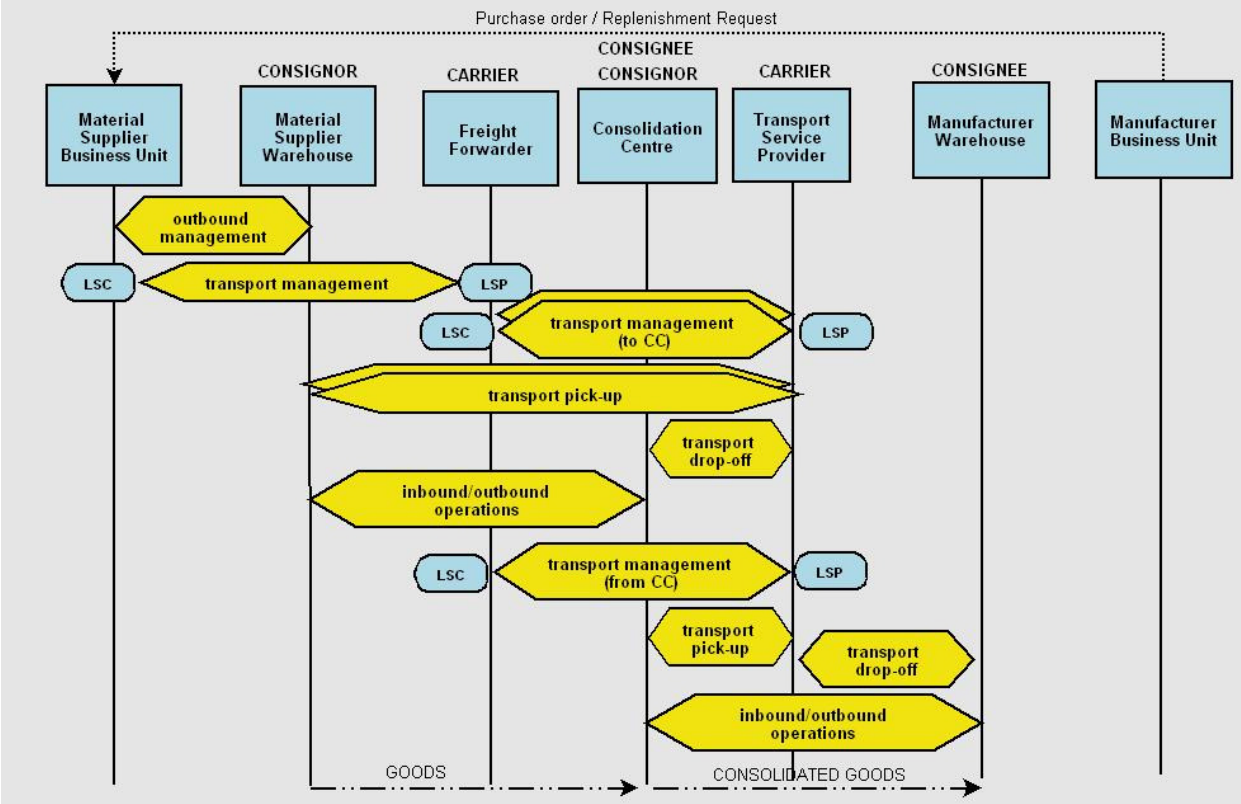
Variation 2: Warehouse Service Provider can manage the transport on behalf of the Manufacturer. In that case he will act as the LSC in the Transport Management process.

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 described in paragraph 5.3.

Figure 2-3 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 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 center receives and groups the goods (**transport pick-up** / **drop-off to CC**).
- The Freight Forwarder centralizes 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 center organizes 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 on 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

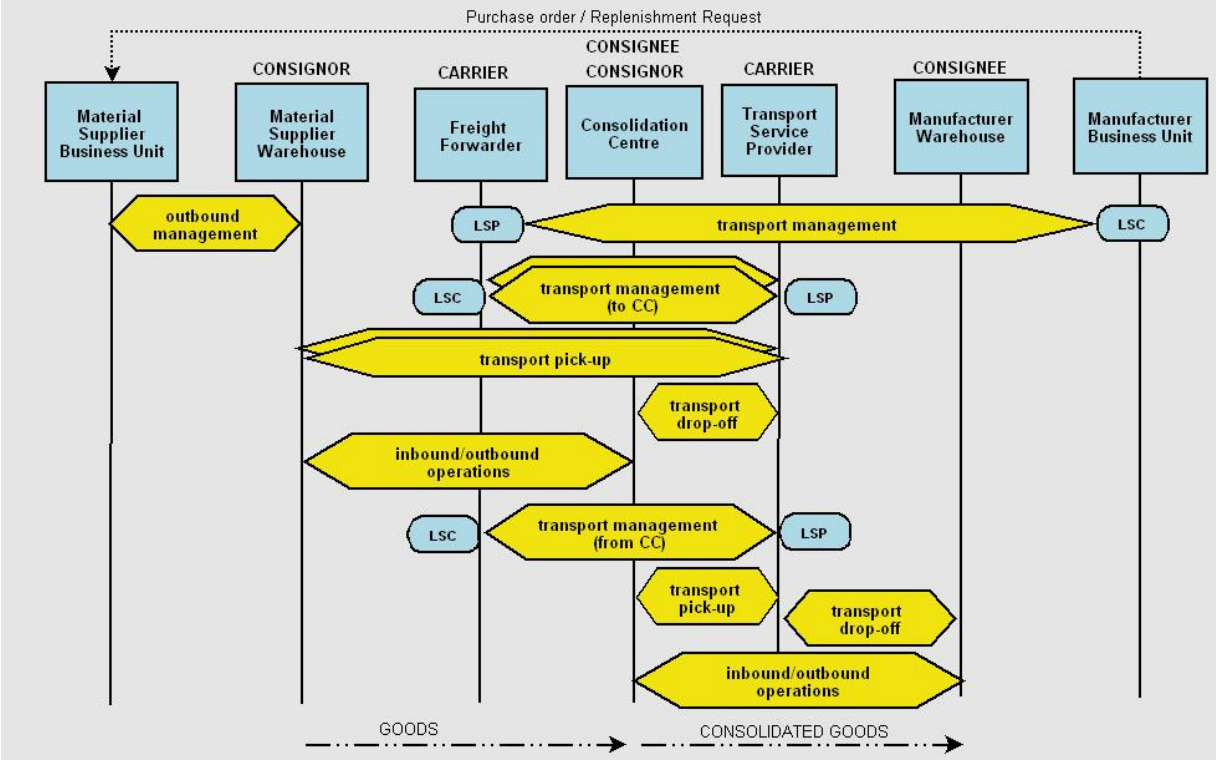
Variation 1: In case the consolidation centre can or will not manage the outbound operations the Material Supplier Business Unit will need take care of this. This means that after shipment the Consolidation Centre will send the Despatch Notification to the Material Supplier Business Unit and he will forward it to the Manufacturer Warehouse. The Manufacturer will send the Receipt Notification directly to the Material Supplier Business Unit.

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 Center (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 2-4 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 centralizes 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).**

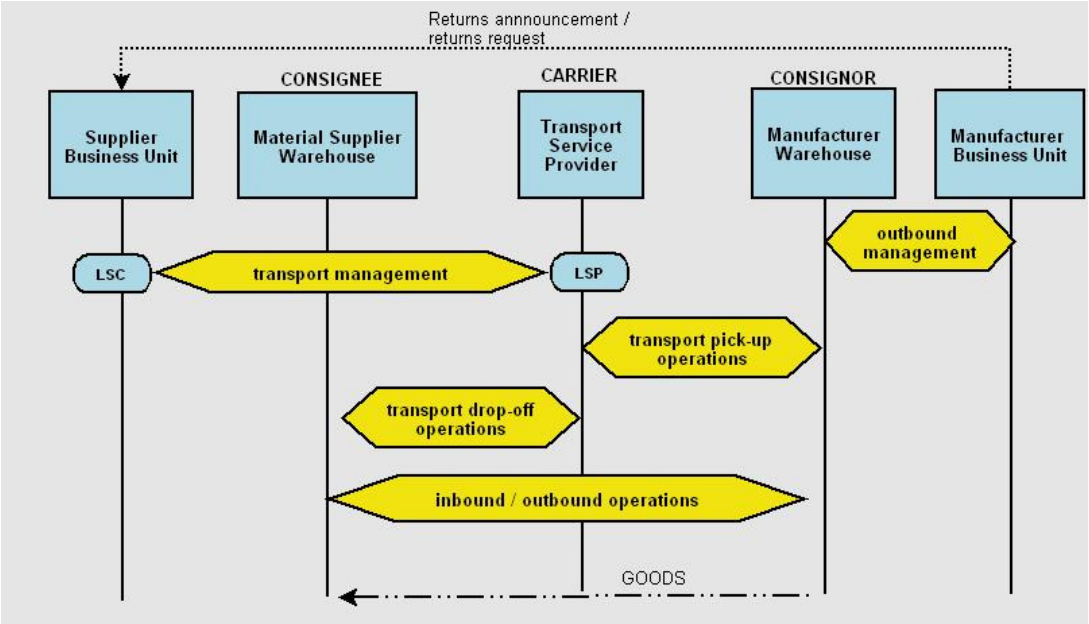
Most common variations

Variation 1: 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.

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 2-5 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, and 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

Variation 1: 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.

3. Manufacturer Intra-company Scenarios

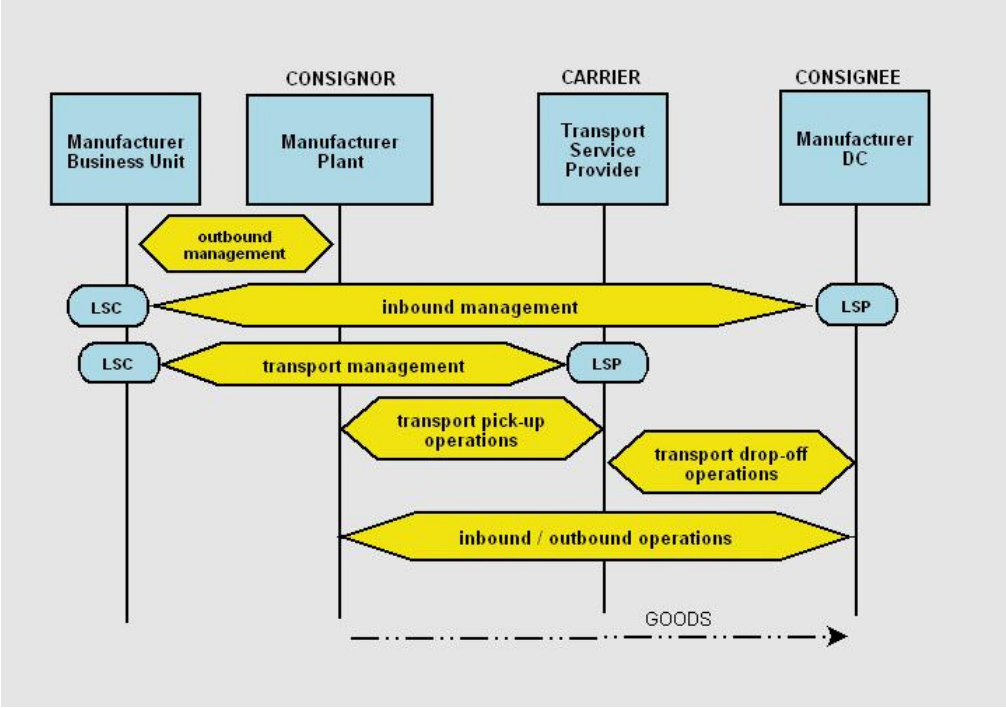
3.1. Transport from Manufacturer Plant to Manufacturer DC

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 3-1 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 transport management is done by the Manufacturer DC

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.

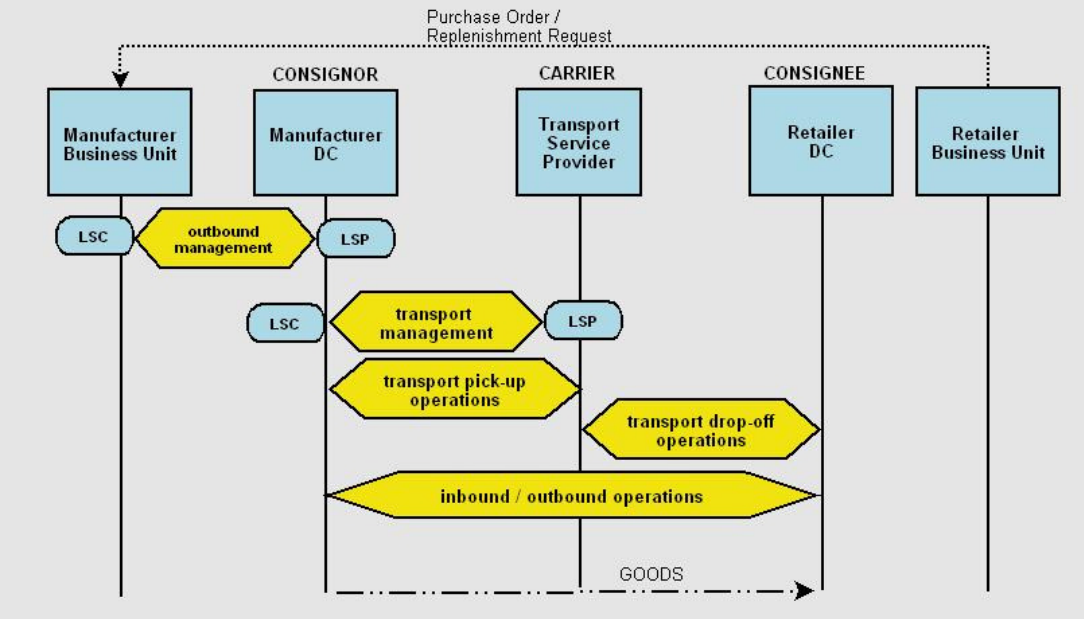
4. Scenarios between Manufacturer and Retailer

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 fulfillment 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. In the detailed description this has been assumed.

Figure 4-1 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 being 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 truck load) quantities only. In this scenario the information-flows will generally be exactly the same as in a shipment from Manufacturer self-operated DC (see variation 1).

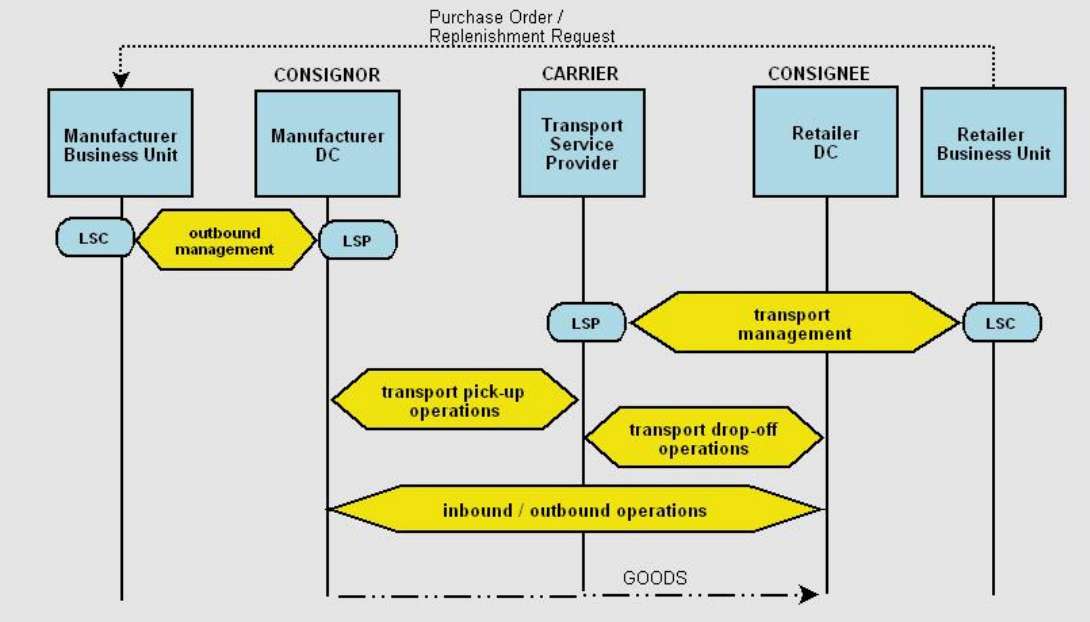
Retailer DC may also be operated by a Logistic Services Provider. In this case the inbound module may be required (as the retail warehousing may then be managed in another IT-system).

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 himself.

Figure 4-2 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 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

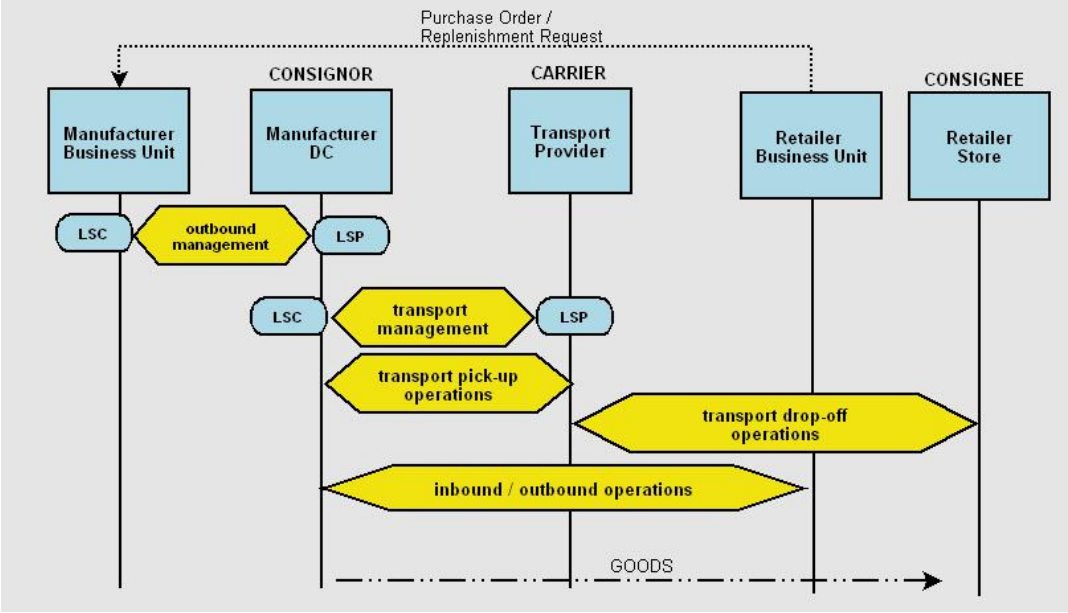
Common variation 2: Manufacturer operates DC himself. In this case the **outbound module** between DC and Manufacturer may not be required.

4.3. 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 fulfillment 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 4-3 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, 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 won't) 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.

A common variation is where the manufacturer operates the DC by himself. This is a classical process in the FMCG Industry where a manufacturer operates his own DC and has his 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.

Another common variation is where 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

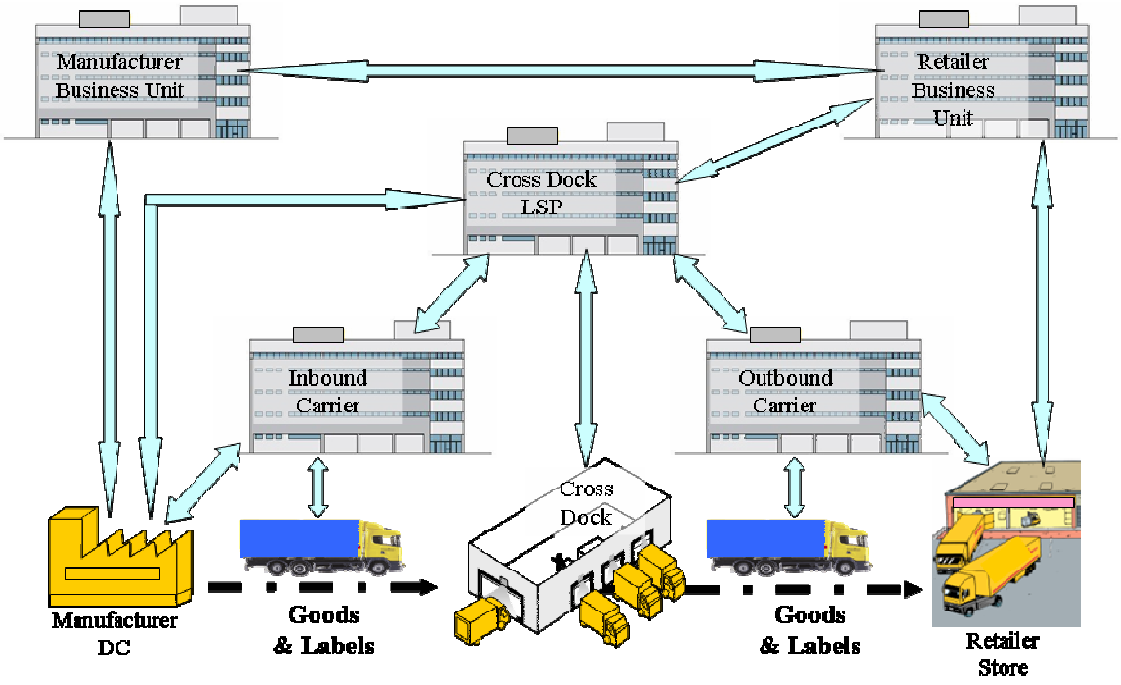
warehousing may then be managed in same IT-system).In this case the Manufacturer will also communicate directly with the Transport Provider/s. Therefore in that case the **transport management module** will extend between Manufacturer and Transport LSP as shown in diagram above.

4.4. 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 4-4 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.

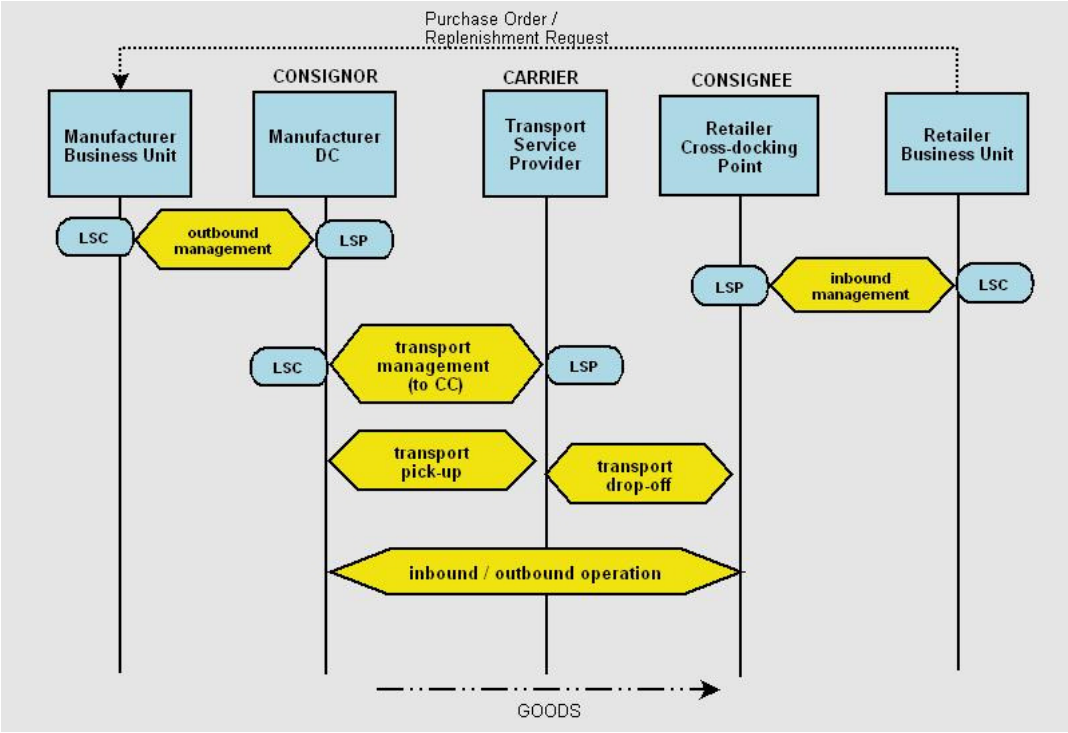
1. The shipment/s moving from the Manufacturer's DC into the Cross-docking Point.
2. The shipments moving from the Cross-docking Point into the Retailer stores.

4.4.1. 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 4.1 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 4-5 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 retailers 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 don’t 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 synchronize 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.

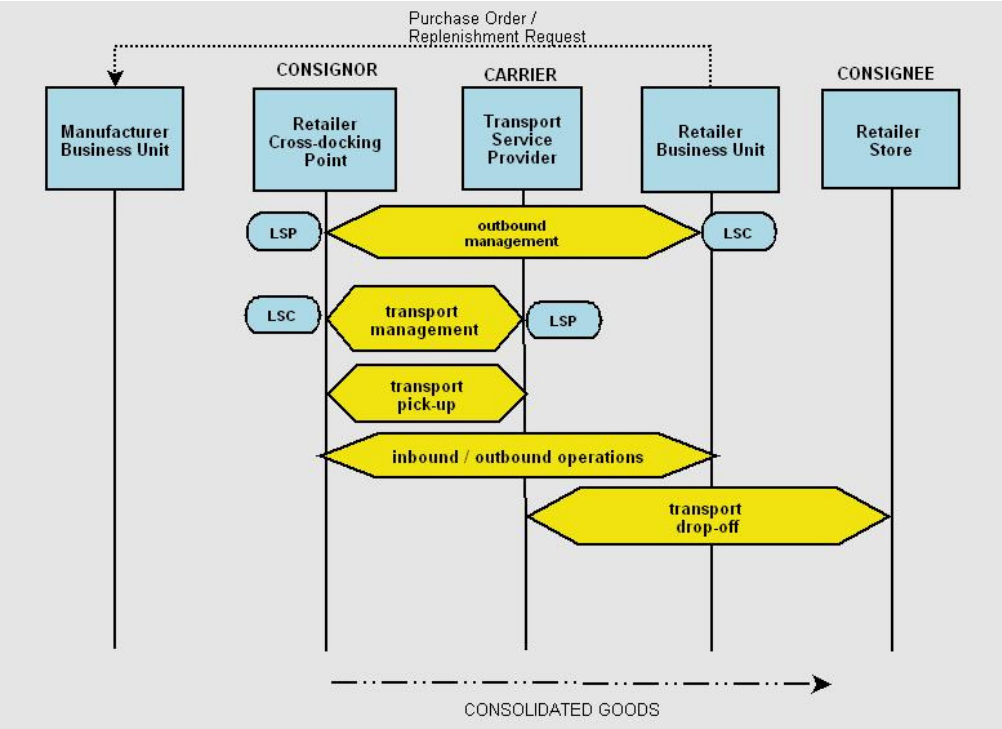
Common variation 3: Manufacturer operates the DC himself.

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

4.4.2. 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 4-6 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.

4.5. 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 specialized 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 (specialized) 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 specialized 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.

Remarks

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.

4.6. 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:

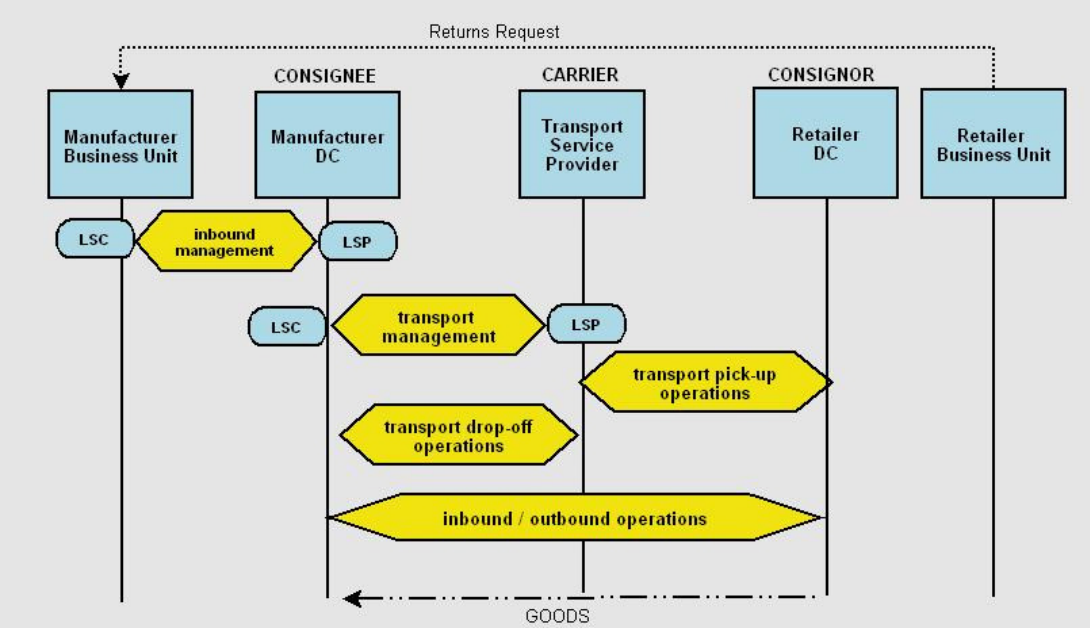
- The Transport Service Provider doing the delivery immediately takes back the unannounced Returns.

  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 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 4-7 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 authorization 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.

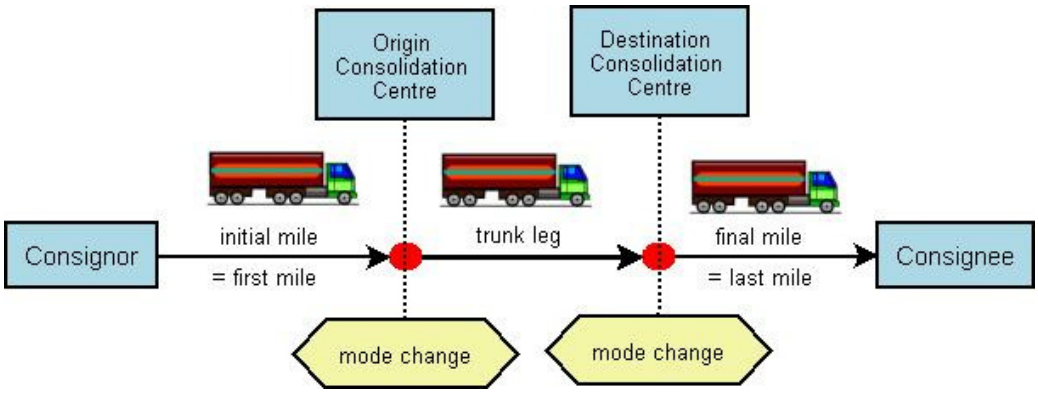
- The Manufacturer DC will send a Receipt Confirmation for Goods Returned to the manufacturer. (**Inbound Management**)
- The Manufacturer Business Unit records the receipt of the returned goods in his systems to update Inventory (as well as in preparation for financial settlement regarding the goods returned).

5. Transport managed by freight forwarders

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

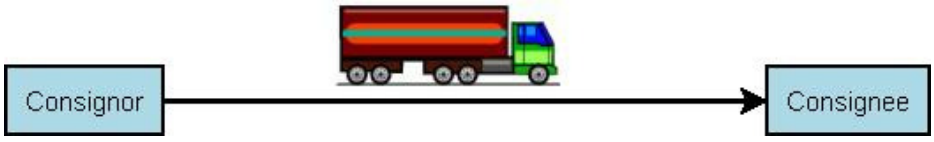
1. The Freight Forwarder is responsible for planning and monitoring execution only. In this scenario the freight forwarder never actually handles the Goods. The carriers selected by the Freight Forwarder will execute all handling and execution whilst the Forwarder retains responsibility for overall monitoring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

Figure 5-1 4PL



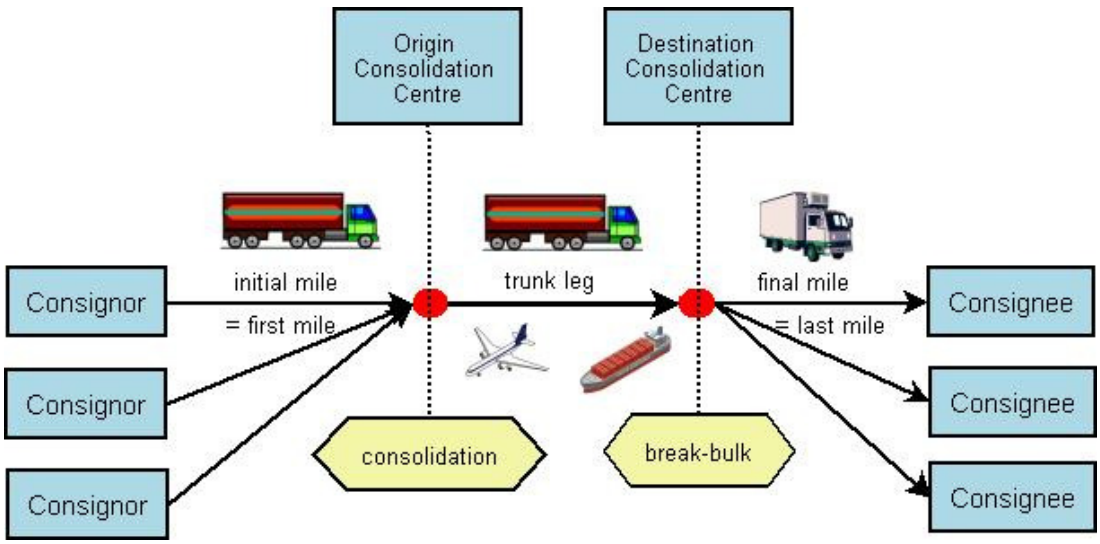
Also when goods (Full Truck Loads) are moved directly from Consignor to Consignee, under responsibility of a Freight Forwarder, this is considered to be a 4PL scenario.

Figure 5-2 Direct FTL Transportation



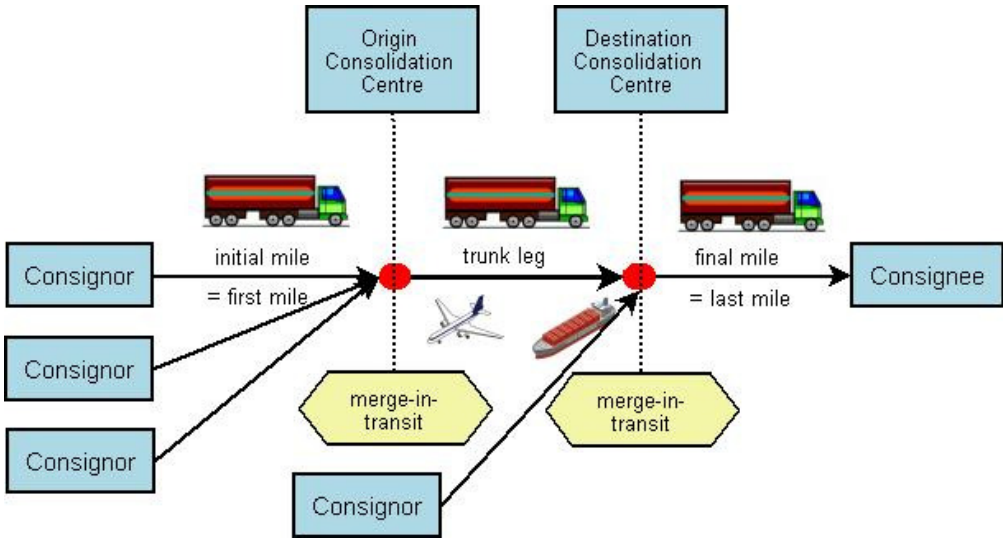
2. The Freight Forwarder also physically handles the goods in a Consolidation Centre. The Freight Forwarder may receive many (small) shipments from a number of his LSC. Freight forwarder may arrange for the transport pick-up and delivery to his consolidation centre. He will then consolidate these into so-called bulk-shipments. Usually the delivery-point for these bulk-shipments 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 5-3 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 client. This model is also known as Merge-In-Transit (MIT).

Figure 5-4 Merge-In-Transit (MIT)



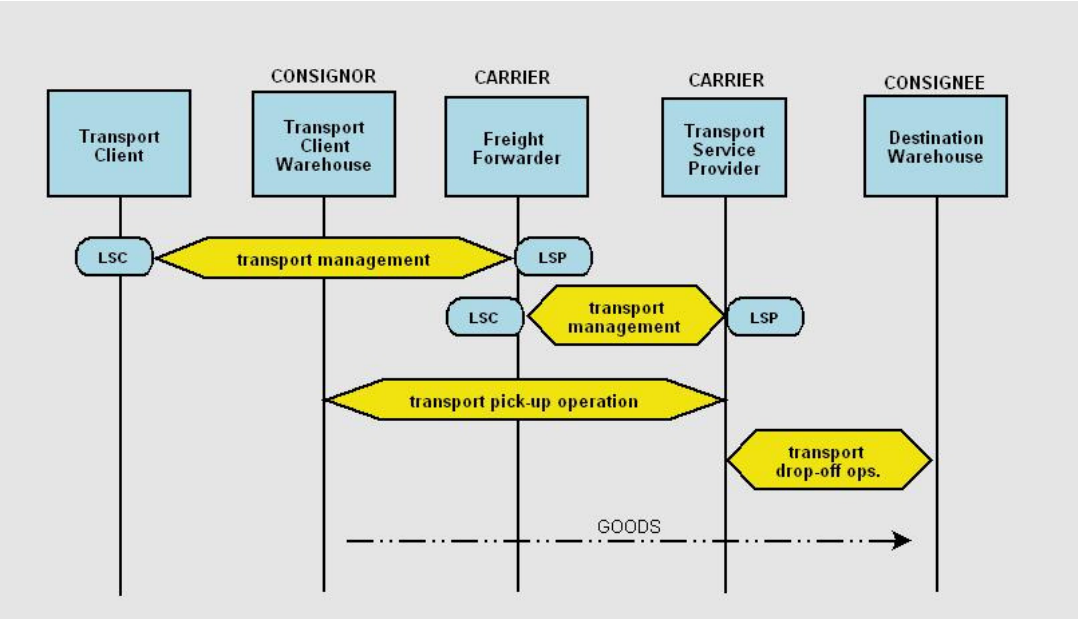
Note: All scenarios assume that the forwarder and carrier/s handle entire shipments and/or Transport Units only. These parties have no interest in GTIN-level information unless it is important to select appropriate transportation/carriers e.g. Hazardous classes, Temperature control information may be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

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 Client. Nearly always the Forwarder simply books the Transport Instruction (as received from the Client) with the Carrier.

Figure 5-5 Forwarder is responsible for Planning and Monitoring only (4PL)



The sequence of events is as follows:

- Once shipments have been created in Transport Clients systems the Transport Client 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 Client) 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 Carrier (Transport Provider) assigned to each shipment. (**transport management**)
- Carrier may arrange for a Pick-up Request with the Transport Clients 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 shipments from the Transport Clients Warehouse via the Carrier to the Consignee's Warehouse. These shipments 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 shipment from the Carrier (**transport**).
- The Carrier may at any point send (latest) status of the shipment 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 Client 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 Client (**transport**). This may be in response to the request received from the Transport Client but the Forwarder may also initiate the transfer of this information based on schedules agreed with the Transport Client.

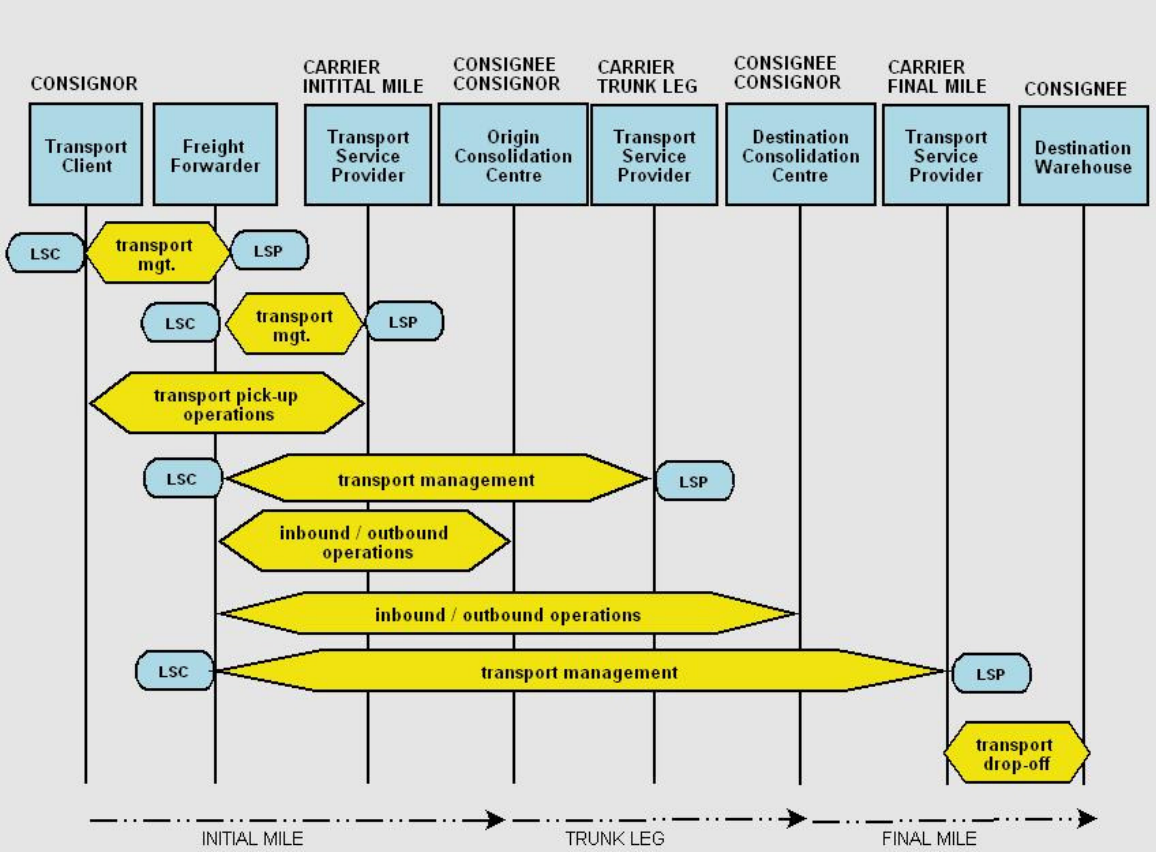
5.2. Consolidation and Break-Bulk operations.

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 Services Clients (LSC) or Transport Clients.

The Freight Forwarder may arrange for the transport pick-up from the Transport Clients 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 5-6 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 Clients systems the Transport Client 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 Client) 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 Clients Warehouse (**transport pick-up**). Warehouse may then confirm the Pick-up Request (**transport pick-up**)
- Initial Mile Carrier might (but most likely won't) 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 Clients 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 – shipments**)
- 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 Clients) 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 Clients 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 Client need to be consolidated into which bulk-shipment. (**Outbound – shipments**)
- The Trunk-Leg Carrier might (but most likely won't) 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 won't) 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-shipments 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 shipments expected to arrive at the Destination Consolidation Centre to that Consolidation Centre (**Inbound – shipments**)
- The Destination Consolidation Centre may confirm receipt of the shipments to the Freight Forwarders IT systems (**Inbound – shipments**)
- Freight Forwarder will then create delivery-shipments in his IT-system/s (based on Transport Instruction received from his Clients) to deliver the individual shipments received from the Clients 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 Clients 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 Client need to be consolidated into which delivery-shipment. (**Outbound – shipments**)
- The Final-Mile Carrier might (but most likely won't) 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. Client may provide information about the original Client-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 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 Client 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 Client (**transport management**). This may be in response to the request received from the Transport Client but the Forwarder may also initiate the transfer of this information based on schedules agreed with the Transport Client.

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 5.2.

The diagram that illustrates the main interactions between the parties involved in this scenario looks identical to that included in section 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 Client shipments in relation to each other.

Forwarding in general is concerned with managing single Client 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 Client shipments get 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 Client 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 Client warehouses from which the individual shipments originate. The Client 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 Client creates a Merge-In-Transit in his IT-systems. This identifies exactly which products will be shipped in which quantities from which Client Warehouse/Site and to which final consignee (including the planned due-date for delivery).
- Client 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 Clients systems the Transport Client 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-shipment 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**)

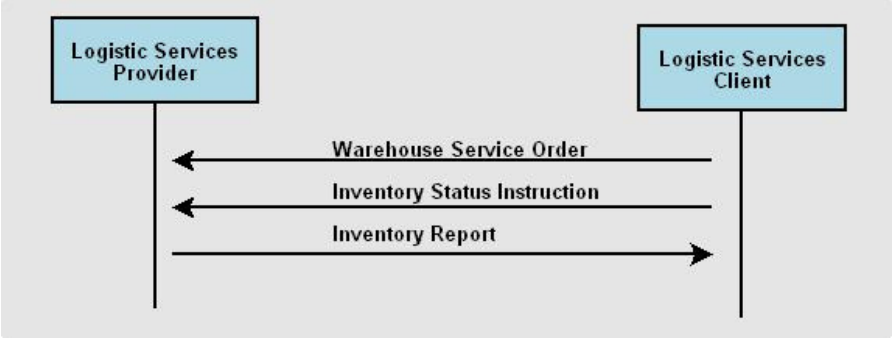
- The Forwarder will instruct the Destination Consolidation Centre exactly which inbound shipments (either received as-is from the Client or already merged at Origin) need to be consolidated into the delivery-shipment. Only after all component shipments have been consolidated the delivery to the final 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.

6. Warehousing scenarios

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

Figure 6-1 Warehousing scenarios



6.1. Inventory Management

6.1.1. 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.

6.1.2. 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 / logistic unit code may be provided.

There is no instruction from the logistic service client, 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 Logistic Service Client will manually request a stock status report.

6.1.3. Inventory Activity Reporting

The recording of movements and adjustments and their reporting towards the Logistic Service Client 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-palletize, 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).

6.2. Services

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

6.2.1. Re-palletization

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

Note: Re-palletization should not be confused with repacking operations.

The Logistic Service Client will send to the Warehouse Service Provider a Warehouse Service Order containing the instruction to re-palletize.

Remarks
For traceability purposes it is important that the LSP preserves the link between the old and the new SSCC.

6.2.2. 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.

Remarks
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.

6.2.3. 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 3rd 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, logistic units and locations. Each party will record the links between logistics units (SSCC) and goods (GTIN + batch / lot).

SECTION IV – APPENDICES

Appendix A: Glossary of terms

Name	Definition
4PL	Scenario in which the Logistic Services Provider is responsible for planning and monitoring execution only. He will contract the carriers responsible for the actual movement of the goods.
Acceptance of goods	**[4]** The process of receiving a consignment usually against the issue of a receipt. As and from this moment the party accepting the consignment becomes responsible for the consignment.
ADR	**[6]** Agreement for Dangerous goods by Road. A European agreement concerning the international carriage of dangerous goods by road.
Back haul	**[6]** The return movement of a means of transport, which has provided a transport service in one direction.
Bill of lading	**[4]** 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: 1. A receipt for goods, signed by a duly authorized person on behalf of the carriers. 2. A document of title to the goods described therein. 3. Evidence of the terms and conditions of carriage agreed upon between the two parties. **[note]** Generally two types are distinguished. 1. House BOL are issued by the Forwarder. 2. Master BOL are issued by the Carrier. They can cover multiple House BOL
Bonded warehouse	**[6]** A warehouse in which goods are stored under custody of customs authorities until they are cleared by the customs or are otherwise properly released.
Booking	**[4]** In transport: The process of making a reservation for space on a means of transport for the movement of goods.
Bordereau	**[4]** Document used in road transport, listing the cargo carried on a road vehicle, often referring to appended copies of the road consignment note. Synonym: Manifest
Break-bulk	Break-Bulk is the process that deals with splitting up (deconsolidating) a consolidated shipment into multiple different parts. In general the resulting parts (within forwarding and transportation scenarios) will be the shipments that were originally incorporated into the consolidated shipment. In some break-bulk scenarios however even the original shipments will be split up (usually based on SKU). In all cases the resulting parts from break-bulk may be consolidated again into shipments for the next destination from the Consolidation Centre.
Bulk cargo	**[6]** Unpacked homogeneous solid or liquid cargo (that is transported loose in a certain space of a vessel), e.g. oil and grain. (Synonyms: Break-bulk, general cargo and uncontainerized).

Name	Definition
Business Unit	Organizational 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	**[4]** Party to which goods or services are sold.
Cargo manifest	**[4]** Listing of goods comprising the cargo carried in a means of transport or in a transport-unit. The cargo manifest gives the commercial particulars of the goods, such as transport document numbers, consignors, consignees, shipping marks, number and kind of packages and descriptions and quantities of goods.
Carrier	**[4]** Party undertaking the transportation of goods from one point to another.
CMR note	Document, which –when signed- evidences a contract between a carrier and a sender for the carriage of goods by road (generic term). For international road traffic, this document must contain at least the particulars prescribed by the convention on the contract for the international carriage of goods by road. Synonym: Road consignment note.
Commercial invoice	**[4]** Document claiming payment for goods or services supplied under conditions agreed between seller and buyer.
Consignee	**[4]** 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	**[10]** A consignment is a separately identifiable collection of Consignment Items (available to be) transported from one Consignor to one Consignee via one or more modes of transport as specified in one single transport service contractual document. Clarifications by TBG3 (UN/CEFACT): ▪ A Consignment can only have one Transport Service Buyer ▪ A Consignment can only have one Transport Service Provider ▪ A Consignment can only have one Consignor ▪ A Consignment can only have one Consignee ▪ The Transport Service Buyer can be either the Consignor or the Consignee ▪ A Consignment is made up of one or more Consignment Items ▪ A Consignment can be made up of some or all Trade Items (aggregated into Consignment Items) from one or more Shipments ▪ A Consignment is made up of one or more Customs Items for reporting to Customs ▪ A Consignment can have one or more Customs UCRs
Consignment note	**[4]** A document prepared by the consignor or on behalf of, which evidences a contract for the transportation by a carrier (normally road or rail) of one consignment from a named place of acceptance to a named place of delivery.
Consignment Item	**[10]** A separately identifiable quantity of products grouped together by Customs tariff code or packaging for transport purposes. A Consignment Item is the lowest level of information within a Consignment. In the case of cross-border consignments each Consignment Item must have only one associated Customs tariff code in order to satisfy Customs requirements. ▪ A Consignment Item can contain one or more Trade Items ▪ A Consignment Item can only have one associated Customs tariff code

Name	Definition
Consignor	**[4]** The party by whom the goods, cargo or containers are sent. The physical despatch can be done by another party. Synonym: Shipper.
Consolidation	**[4]** The grouping together of individual consignments of goods into a combined consignment for transport.
Consolidation Centre	The site (location) where the consolidation process is supported and executed by the Logistics Service Provider. Synonym: Logistics Hub
Co-packing	**[3]** Packaging operation, often executed by the logistic service provider in a warehouse zone which consists of assembling either different products or the same products under the same packaging, (consumer batches, sample of a new product added to the normal one, …).
Cross-docking	**[APICS]** 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.
Customer	**[4]** An organization or individual to which or to whom goods and/or services are supplied.
Customs	**[Wiki]** Customs is an authority or agency in a country responsible for collecting customs duties and for controlling the flow of animals and goods (including personal effects and hazardous items) in and out of a country. Depending on local legislation and regulations, the import or export of some goods may be restricted or forbidden, and the customs agency enforces these rules.
Customs area	**[Wiki]** A customs area is an area designated for storage of commercial goods that have not yet cleared customs. It is surrounded by a customs border. Most international airports and harbours have designated customs areas, sometimes covering the whole facility and including extensive storage warehouses. While territorially part of the country of the customs authorities, goods within the customs area have not technically entered the country yet, and may be subject to customs duties. The goods within the area are also subject to checks regarding their compliance with local rules (for example drug laws and bio-security regulations), and thus may be impounded or turned back. For this reason, the customs areas are usually carefully controlled and fenced. The fact that goods are technically still outside the country of the customs area also allows easy transshipment to a third country without the need for customs checks.
Customs brokerage	**[Wiki]** 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 client 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. 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.
Customs clearance	The process of taking care of all the formalities related to the export or import of cargo. Clearance may be done by e.g. Consignor, Consignee, Forwarder or special agent (a.k.a. Customs Broker)

Name	Definition
Customs duties	**[6]** Duties laid down in the customs tariff, to which goods are liable on entering or leaving the customs territory.
Customs Invoice	**[6]** Document required by the customs in an importing country in which an exporter states the invoice or other price (e.g. selling price, price of identical goods), and specifies costs for freight, insurance and packing, etc., terms of delivery and payment, for the purpose of determining the customs value in the importing country of goods consigned to that country
Customs Value	**[6]** The value of a commodity declared for customs purposes.
Dangerous Goods	**[6]** 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.
Dangerous Goods Declaration	**[6]** Document issued by a consignor in accordance with applicable conventions or regulations, describing hazardous goods or materials for transport purposes, and stating that the latter have been packed and despatched in accordance with the provisions of the relevant conventions or regulations (Synonym: DGN).
Delivery	**[4]** The physical process of handing over goods to the consignee or to the party acting on his behalf.
Delivery date	The date on which the delivery of goods takes place (actual) or is scheduled to take place (planned) or is requested to take place (due).
Delivery Note	**[3]** 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	**[6]** 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	**[6]** An establishment (consisting of one or more warehouses and loading and unloading facilities) where the receipt, storage and distribution of goods take place. (Distribution centre = Warehouse + Forwarding services).
Estimated time of arrival (ETA)	**[4]** Date (and time) when a carrier estimates that a means of transport is expected to arrive at its place of destination.
Estimated time of departure (ETD)	**[4]** Date (and time) when carrier estimates that a means of transport should depart from its place of departure.
Export License	**[6]** Document granting permission to export as detailed within a specified time.
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
Forwarder	**[Wiki]** A forwarder is an individual or company that despatches shipments via asset based carriers and books or otherwise arranges space for those shipments. Common carrier types could include waterborne vessels, airplanes, trucks or railroads. Forwarders typically arrange cargo movement to an international destination. Also referred to as international freight forwarders, they have the expertise that allows them to prepare and process the documentation and perform related activities pertaining to international shipments. Some of the typical information reviewed by a freight forwarder is the commercial invoice, shipper's export declaration, and other documents required by the carrier or country of export, import, or transshipment.

Name	Definition
Forwarding	**6]** The action of taking care of the despatch or receipt of shipments and the organization 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	**[6]** 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: ▪ movement and handling of goods (shipping, forwarding and stowage), ▪ customs formalities, ▪ distribution of documents, ▪ allocation of documents (freight and charges for the connected operations), ▪ special instructions (insurance, dangerous goods, goods release, additional documents required). Synonyms: Consignment Instruction, Shipping Instruction
Freight	1. Goods in transport from one location to another. 2. The amount of money due for the carriage of goods and payable either in advance or upon delivery. 3. The revenue earned from the movement of cargo.
Freight Consolidation	**[APICS]** The grouping of shipments to obtain reduced costs or improved utilization of the transportation function. Consolidation can occur by market area grouping, grouping according to scheduled deliveries, or using third-party pooling services such as public warehouses and freight forwarders
Freight costs	**[4]** 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).
Freight invoice	**[4]** Document/message issued by a transport service provider, specifying freight costs and charges incurred for a transport operation and stating conditions of payment. Synonym: Freight bill
Full container load (FCL)	**[4]** For operational purposes a full container load (FCL) container is considered a container into which no cargo can be added during the time it is transported under FCL conditions. The container is stuffed or stripped under the responsibility and for account of the shipper or the consignee.
Full truck load (FTL)	**[4]** 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)	**[6]** Abbreviation for the EAN.UCC Global Location Number. A 13- digit non-significant reference number used to identify Legal entities (e.g. registered companies), functional entities (e.g. specific department within a legal entity), or physical entities (e.g. a door of a warehouse).
Global trade item number (GTIN)	**[4]** Identification of a trade item, which is defined as any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced or ordered or invoiced at any point in any supply chain.
GS1 Logistics Label	**[3]** Standardized format of the label, which has been defined by GS1. This label is appropriate for all logistics units and namely shows information that have been symbolized in the UCC/EAN –128 bar codes (in particular the SSCC).

Name	Definition
Harmonised System (HS)	**[6]** Harmonized commodity description and coding system. An international product nomenclature, developed under the auspices of the World Customs Organization (WCO), which is to form the basis throughout the world for the classifications, description and coding of goods for customs, statistics and transport purposes. The nomenclature comprises the headings and subheadings and their related numerical codes, the section, chapter and subheading notes and the general rules for the interpretation of the harmonized system.
Import License	**[6]** A document which permits the importation of a product or material into a country where such licenses are necessary. Licenses vary per product or product category in different countries and their issue depends on the needs or requirements of a governmental body to restrict or control and thereby limit the importation of any given product. In a few countries, licenses are used for compiling statistics only.
Inbound	Coming in, heading inwards. Used in this model to refer to goods moving into a warehouse.
INCOTERMS	**[APICS]** Incoterms or international commercial terms are a series of international sales terms that are widely used throughout the world. They are used to divide transaction costs and responsibilities between buyer and seller and reflect state-of-the-art transportation practices. They closely correspond to the U.N. Convention on Contracts for the International Sale of Goods. Incoterms deal with the questions related to the delivery of the products from the seller to the buyer. This includes the carriage of products, export and import clearance responsibilities, who pays for what, and who has risk for the condition of the products at different locations within the transport process. Incoterms are always used with a geographical location and do not deal with transfer of title. They are devised and published by the International Chamber of Commerce (ICC).
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.
Inter-modal transport	**[Wiki]** Inter-modal transport involves more than one mode of transport. Applied to the transportation it means movement of freight in a container or vehicle, using multiple modes of transportation (rail, ocean vessel, and truck), without any handling of the freight itself when changing modes. The advantage of utilizing this method is that it reduces cargo handling, and so improves security, reduces damages and loss, and allows freight to be transported faster.
Invoice	**[Wiki]** An invoice or bill is a commercial document issued by a seller to a buyer, indicating the products, quantities and agreed prices for products or services with which the seller has already provided the buyer. An invoice indicates that, unless paid in advance, payment is due by the buyer to the seller, according to the agreed terms. There are many different types of invoices one of which is the Pro forma Invoice. In international trade, a pro forma invoice is a document that states a commitment from the seller to provide specified goods to the buyer at specific prices. It is often used to declare value for customs. **[note]** In that case also known as the “Commercial Invoice”.
Less than container load (LCL)	**[4]** The container is stripped and stuffed under the responsibility of the logistic service provider. For operational purposes a less than container load (LCL) container is considered a container in which multiple consignments or parts thereof are shipped.
Less than truck load (LTL)	**[4]** For operational purposes a less than trailer load (LTL) is considered a

Name	Definition
	trailer which multiple consignments or part there of are shipped.
Load (in transport)	**[6]** 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. **[note]** Above definition is usually referred to as the load-factor. Usually in transportation load is a synonym for consignment.
Location ID	Unique identifier for a specific physical location of any type. This identifier is used in Information Systems by (multiple) participant/s involved in Logistics to ensure unambiguous identification whilst automatically processing information exchanged between the Information Systems. Locations may be owned/operated by various parties e.g. Consignor, Consignee, LSC, LSP, Forwarder, Carrier etcetera.
Logistic Service Client (LSC)	**[1]** LOGISTICS SERVICES BUYER = The logistics services buyer is defined as the party ordering the logistics services from the logistics services provider and may be either the consignor or the consignee depending on the business scenario
Logistic service provider (LSP)	**[4]** Party providing logistic services such as warehousing, re-packing products, distribution and assembly. Synonym: Third-party logistics provider (3PL)
Logistic unit	**[4]** An item of any composition established for transport and/or storage, which needs to be managed through the supply chain.
Manifest	**[4]** (in transport) Listing of goods comprising the cargo carried in a means of transport or in a transport-unit. The cargo manifest gives the commercial particulars of the goods, such as transport document numbers, consignors, consignees, shipping marks, number and kind of packages and descriptions and quantities of goods. Synonym: Cargo manifest. [note] A manifest typically covers multiple consignments
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	**[4]** The particular vehicle used for the transport of goods or persons.
Mode of transport	**[4]** The method of transport used for the conveyance of goods or persons, e.g. by rail, by road, by sea.
Multi-modal transport	**[4]** The carriage of goods and or equipment utilizing at least two different modes of transport.
Order	**[4]** Document/message by means of which a buyer initiates a transaction with a seller involving the supply of goods or services as specified, according to conditions set out in an offer, or otherwise known to the buyer.
Outbound	Leaving or departing; traveling away from; outward bound. Used in this model to refer to goods moving out of a warehouse.
Package	**[4]** The final product of the packing operation consisting of the packing and the contents, e.g. a box, carton, crate, barrel, pallet, etc.
Packaging	**[6]** Materials and components used in any packaging operation to wrap, contain and protect articles or substances during transport.
Packing list	**[4]** Document specifying the distribution of goods in individual packages.

Name	Definition
Place of acceptance	**[6]** The place at which the goods in a consignment are taken over by a carrier and where the responsibility of the carrier starts.
Place of delivery	**[4]** Place to which the goods are to be delivered under transport contract terms (operational term). This may be different of the place of the consignee.
Place of departure	**[6]** A port, airport or other location from which a means of transport is scheduled to depart or has departed.
Place of despatch	**[4]** Place at which the goods are taken over for carriage (operational term), this place be different from the transport contract place of acceptance.
Proof of delivery	**[6]** 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	**[wiki]** A retailer sells goods or merchandise, from a fixed location such as a department store or kiosk, in small or individual lots for direct consumption by the purchaser.
Seller	**[4]** Party selling goods or services.
Shipment	**[10]** A shipment is an identifiable collection of one or more Trade Items (available to be) transported together from the Seller (Original Consignor/Shipper), to the Buyer (Final/Ultimate Consignee). Clarifications: ▪ A Shipment can only be destined for one Buyer ▪ A Shipment can be made up of some or all Trade Items from one or more Sales Orders ▪ A Shipment can have only one Customs UCR ▪ A shipment may form part or all of a Consignment or may be transported in different Consignments.
Shipping instruction	**[4]** Document providing all details required for the physical movement of a consignment.
Serial Shipping Container Code (SSCC)	**[3]** Abbreviation for Serial Shipping Container Code. It's the international code consisting of 18 digits whose structure has been defined by GS1 and enabling to identify each logistic unit uniquely. When symbolized in UCC/EAN – 128 on the logistic unit and transmitted in the despatch advice, it allows ensuring the traceability of the products.
Supplier Managed Inventory (SMI)	In SMI the material supplier manages the stock levels and availability in the manufacturers (his customer's) warehouse based on forecasted demand. SMOI: Supplier Managed and Owned Inventory . The SMI process variant with consignment stock from the material supplier at the manufacturers site.
Terms of delivery	**[4]** All the conditions agreed upon between a seller and a buyer with regard to the delivery of goods and/or services, e.g. CIF, DDP, DDU, FOB or EXW from the INCOTERMS Terms of Delivery.
Terms of freight	**[4]** All the conditions (to be) agreed upon between a transport service provider and a transport service buyer about the type of freight and charges due to carriage and whether they are prepaid or are to be collected.

Name	Definition
Terms of transport	**[4]** All the conditions agreed upon between a transport service provider and a transport service buyer with regard to the transportation of goods, e.g. CIF, DDP, DDU, FOB, or EXW from the INCOTERMS Terms of Delivery.
Tracing	**[4]** The function of retrieving information concerning goods, goods items, consignments or equipment.
Tracking	**[4]** The function of maintaining status information of goods, goods items, consignments or equipment.
Trade item	**[4]** A trade item is defined as any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced or ordered or invoiced at any point in any supply chain.
Transportation Hub	**[Wiki]** A location where traffic is exchanged across several modes of transport. These modes may include any of railway, tramway, rapid transit, bus, automobile, truck, airplane, spacecraft, ship, ferry, pedestrian or any other kind of transportation. The term is used both for passenger and freight transfers. Some transportation hubs also allow transport to be exchanged between the same kind of transport mode.
Transport	**[6]** The process of conveying freight from the point of despatch to the point of receipt.
Transport status	**[4]** The status of a shipment or group of shipments. For example, in transit, damaged, delayed, or diverted.
Trunking (in forwarding)	The process of moving consolidated shipments from one consolidation centre to another to support the processes of Freight Consolidation and Break-Bulk operations.
Ultimate consignee	**[4]** Party who is the final recipient of a consignment.
UN/LOCODE	**[6]** System of codes maintained by the United Nations, which identifies the ports of entry and exit for customs and reporting purposes.
Warehouse	**[6]** A building specially designed for receipt, storage, material handling, reconditioning and shipping of products.
Warehousing	**[6]** The activity of holding and handling goods and/or articles/products and reconditioning the articles forming a products in a store (therefore including internal transport within an operational unit).
Waybill	**[APICS]** A waybill is a document issued by a carrier giving details and instructions relating to the shipment of a consignment of goods. Typically it will show the names of the consignor and consignee, the point of origin of the consignment, its destination, route, and method of shipment, and the amount charged for carriage. Unlike a bill of lading, which includes much of the same information, a waybill is not a document of title. [note]: Generally two types are distinguished. 1. House Waybills are issued by the Forwarder. 2. Master Waybills are issued by the Carrier. They can cover multiple House Waybills

Appendix B: Sources and references

[1]	Multi Industry Scenarios for Transport	EEG2 (UN/CEFACT)	Version 2000
[2]	Supply Chain Management Handbuch	ECR D-A-CH	July 2003
[3]	Logistic Service Providers – Process and Scenario	GS1 France	February 2006
[4]	EAN.UCC Trans-Core Business Process Models	EAN.UCC	February 2000
[5]	VICS Logistics Model	VICS	Rev 1/14/99
[6]	Introduction to EANCOM® in Trade and Transport	EAN International	November 2001
[7]	Business Message Standards 2.0.2	GS1	2005
[8]	Call To Action Logistics Services	GS1	8 November 2006
[9]	European Logistic Label (ELL)	GS1 Europe	2006
[10]	Definitions (not a formal document)	TBG3 (UN/CEFACT)	2007

Appendix C: The GS1 Standards

C.1 GS1 System

The GS1 System is an integrated system of global standards that provides for accurate identification and communication of information regarding products, assets, services and locations. It is the most implemented supply chain standards system in the world.

The GS1 System is the foundation of a wide range of efficiency-building supply chain applications and solutions. Based on GS1 Identification Keys, a common recurring set of identification keys, the GS1 System is composed of four key product areas:

C.1.1 GS1 BarCodes

Global data and application standards for bar codes that use the globally recognised GS1 Identification Keys to automatically identify things such as trade items, locations, logistic units, and assets.

C.1.2 GS1 eCom

Global standards for electronic business messaging that allow rapid, efficient and accurate automatic electronic transmission of agreed business data between trading partners. Based on two components: EANCOM® and GS1 XML.

C.1.3 Global Data Synchronisation Network

The Global Data Synchronisation Network™ (GDSN™) is an automated, standards-based, global environment that enables secure and continuous data synchronisation , allowing all partners to have consistent item data in their systems at the same time. Global Product Classification (GPC) is a key component of GDSN , enabling effective category management.

C.1.4 GS1 EPCglobal

A new global standards system that combines RFID (radio frequency identification) technology, existing communications network infrastructure and the Electronic Product Code (a number for uniquely identifying an item) to enable immediate and automatic identification and tracking of an item through the whole supply chain globally, resulting in improved efficiency and visibility of the supply chain.

C.2 GS1 Identification Keys

Below is the list the GS1 Identification keys relevant to the logistics processes.

C.2.1 GTIN (Global Trade Item Number)

The GTIN helps automate the trading process – basically buying and selling. GTINs are therefore assigned to any item (product or service) that may be priced, or ordered, or invoiced at any point in any supply chain. The GTIN is then used to retrieve pre-defined information about the item. The key benefit is that information about the item can be retrieved about the product from the GTIN whether it is read in a GS1 Bar Code, exchanged via a GS1 eCOM message or accessed from the Global Data Synchronisation Network.

C.2.2 GLN (Global Location Number)

The GLN is the GS1 Identification Key for Locations. The GLN can be used to identify physical locations and legal entities where is a need to retrieve pre-defined information to improve the efficiency of communication with the supply-chain. Global Location Numbers are a prerequisite for GS1 eCom message or to access information from the Global Data Synchronisation Network.

C.2.3 SSCC (Serial Shipping Container Code)

The SSCC is the GS1 Identification Key for an item of any composition established for transport and/or storage which needs to be managed through the supply chain. The SSCC is assigned for the life time of the transport item and is a mandatory element on the GS1 Logistics Label using Application Identifier (00).

C.2.4 GRAI (Global Returnable Asset Identifier)

The GRAI is the GS1 Identification Key for types of reusable package or transport equipment that are considered an asset. It is used to enable tracking as well as recording of all relevant data associated with the individual asset or asset reference. The GRAI is is assigned for the life time of the asset and may be bar-coded using Application Identifier (8003).

Appendix D: Existing message standards

LIM Transaction	EANCOM®	X12	GS1 XML
Interoperation Settings	This information is not exchanged via a message		
Location Master Data	Party Information (PARTIN)	Organizational Relationships (816)	Party
Item Master Data	Price/Sales Catalogue (PRICAT), Product Data (PRODAT)	Item Maintenance (888), Price/Sales Catalog (832)	Catalogue Item Notification, Item Data Notification
Transport Routing Data	Not available	Motor Carrier Loading and Route Guide (217), Request for Routing Instructions (753), Routing Instructions (754)	Not available
Logistic Services Conditions	Contractual conditions message (CNTCND)	Motor Carrier Tariff Information (218)	Purchase Conditions
Warehousing Requirements	Delivery Schedule (DELFOR)	Not available	Goods Requirements, Replenishment Request
Transport Requirements	Delivery Schedule (DELFOR), Firm booking message (IFTMBF)	Transportation Services Tender (602), Logistics Service Request (219)	Goods Requirements, Replenishment Request
Transport Requirements Reponse	Booking confirmation message (IFTMBC)	Logistics Service Response (220)	Not available
Instruction to Receive	Arrival notice message (IFTMAN)	Transportation Appointment Schedule Information (163)	Not available
Inbound Delivery Status	Order Status Report (OSTRPT), Copy of Receiving Advice (RECADV)	Receiving Advice/Acceptance Certificate (861), Warehouse Stock Transfer Receipt Advice (944)	Copy of Receiving Advice
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 Service Order	Cargo/Goods Handling and Movement (HANMOV)	Warehouse Shipping Order (940)	Not available

LIM Transaction	EANCOM®	X12	GS1 XML
Inventory Status Instruction	Cargo/Goods Handling and Movement (HANMOV)	Inventory Inquiry/Advice (846), Warehouse Inventory Adjustment Advice (947)	Not available
Inventory Report	Inventory Report (INVRPT)	Inventory Inquiry/Advice (846)	Inventory Status or Inventory Activity
Instruction to Despatch	Instruction To Despatch (INSDES), Cargo/Goods Handling and Movement (HANMOV)	Warehouse Shipping Order (940)	Warehouse Shipping Order
Outbound Delivery Status	Order Status Report (OSTRPT); Copy of Receiving Advice (RECADV)	Warehouse Stock Transfer Shipment Advice (943) Warehouse Shipping Advice (945)	Copy of Receiving Advice
Despatch Notification Outbound	Despatch Advice (DESADV)	Warehouse Shipping Advice (945)	Despatch Advice
Receipt Notification Outbound	Receiving Advice (RECADV)	Receiving Advice/Acceptance Certificate (861)	Receiving Advice
Transport Instruction	Transport Instruction (IFTMIN), Forwarding and Consolidation Summary (IFCSUM)	Motor Carrier Shipment Information, 204	Small Package Pickup Manifest; Pickup Notification LTL; Full Truckload Load Tender
Transport Instruction Response	Transport Status (IFTSTA)	Response to a Load Tender (990)	Full Truckload Load Tender Response
Transport Status Request	Transport Status (IFTSTA)	Motor Carrier Shipment Status Inquiry	SPC Shipment Status Inquiry; FTL/LTL Shipment Status Inquiry
Transport Status Notification	Transport Status (IFTSTA)	Transportation Carrier Shipment Status Message (214)	SPC Shipment Status Response, FTL/LTL Shipment Status Response
Final Transport Status Notification	Transport Status (IFTSTA)	Transportation Carrier Shipment Status Message (214)	SPC Shipment Status Response, FTL/LTL Shipment Status Response
Pick-up Request	Instruction To Despatch (INSDES), Cargo/Goods Handling and Movement (HANMOV)	Appointment Schedule Information (163)	Not available
Pick-up Response	Transport Status (IFTSTA)	Motor Carrier Shipment Pickup Notification (216)	Not available
Drop-off Request	Instruction To Despatch (INSDES)	Not available	Not available
Drop-off Response	Transport Status (IFTSTA)	Not available	Not available

LIM Transaction	EANCOM®	X12	GS1 XML
LSC Freight/Service Statement of Charges	Not available	Consolidators Freight Bill and Invoice (223)	Not available
LSP Freight/Service Statement of Charges	Not available	Consolidators Freight Bill and Invoice (223)	Not available
Freight/Service Invoice	Invoice (INVOIC)	Freight Invoice (859), Motor Carrier Freight Bill & Invoice (223), Freight Invoice (210)	Invoice, Freight Invoice
Self-billed Freight/Service Invoice	Invoice (INVOIC)	Freight Invoice (859), Motor Carrier Freight Bill & Invoice (223); Freight Invoice (210)	Invoice, Freight Invoice
Remittance Notification	Remittance Advice (REMADV)	Payment Order/Remittance Advice (820)	Settlement