## TAF TSI - ANNEX A.5 : FIGURES AND SEQUENCE DIAGRAMS OF THE TAF TSI MESSAGES

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Important note

The Trans-European Conventional Rail System

“TELEMATIC APPLICATIONS” subsystem for Freight Services

FIGURES AND SEQUENCE DIAGRAMS OF THE TAF TSI MESSAGES
Intended Audience

This document is one of the references to be used by designers and engineers responsible for the proper implementation of the TAF TSI requirements regarding message exchange according chapter 4.2 of the CR TSI Telematic Applications for Freight Services.

Evolution of this Document

Distribution:

The Document will be delivered by electronic means in MS-Word format or in PDF Format and published on the ERA Web-site: era.europa.eu. New versions will be accessible electronically.

Configuration Management:

Any change requests on the content of this document shall be reported to the European Railway Agency.
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0. INTRODUCTION

0.1. Purpose

This document is the collection of the figures and sequence diagrams to which the TAF TSI refers. It gives support for the right understanding of the verbal description in the TAF TSI.

0.2. References

0.2.1. Regulatory References

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## Figure 5.22: TAF TSI Messages

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1. **FIGURES**

1.1 Example of the critical points in Freight Transport

The figure above shows the critical points (interfaces between the various partners involved) in freight transport on road compared with the critical points of freight transport on rail for a simplified scenario.

1.2 Example for train Path request and RU / IM Communication
With B, D and E as handover points between IMs and C and E as interchange points between RUs the situation is as follows:

- **RU1** has to request a train path A-B from IM1 and B-C from IM2;
- **RU2** has to request a train path C-D from IM2 and D-E from IM3;
- **RU3** has to request a train path E-F from IM4.

The communication during the train running between RU and IM must always be based on train and path number, whereby the IM communicates with the RU, who has booked the train path on his infrastructure. This means for the example above:

- **For the journey section A-B, IM1 communicates with RU1;**
- **For the journey section B-C, IM2 communicates with RU1;**
- **For the journey section C-D, IM2 communicates with RU2;**
- **For the journey section D-E, IM3 communicates with RU2;**
- **For the journey section E-F, IM4 communicates with RU3.**

If an RU provides the complete journey A – F (Open Access by RU, no other RUs are involved), then each IM involved communicates directly with this RU only. This “open access” by the RU can be realised by booking the train path via “One Stop Shop” or in sections with each IM directly. The TSI takes account both cases.

### 1.3 Scenarios for path booking

- **Scenario A:** The RU contacts all involved IMs directly or via the OSS to organise the paths for the complete journey. In this case the RU has also to operate the train on the complete journey according to Article 13 of the Directive 2001/14/EC.

  a) Path booking via OSS by the RU for Transport Journey from A to F

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[Diagram showing the sequence of handovers and communications between RUs and IMs for different journeys.]
b) Direct path booking by the RU for Transport Journey from A to F

- **Scenario** B: Each RU involved in the Transport Journey from A to F contacts the local IMs directly or via OSS to request a path for the journey section on which it operates the train.

In this example:
RU 1 is the LRU to co-ordinate the involved RUs

Remark: In the execution mode, the IM will always communicate with the RU which has booked the path. Therefore the “path ownership” is important for the message exchange during operation of the train.
1.4 Examples for ETI calculation

**Example 1** for calculation of an ETI for LRU 1 and LRU 2 based on TETA from IM2 for interchange point C:

Example 2 for calculation ETI for LRU 1 and LRU 2 based on TETA from IM2 for interchange point C:
1.5 General Architecture Solution Overview
1.6 Access method to the different types of Databases using the common interface

Each instance of the Common Interface will have access to all the data required according the TSI within each RU, IM, etc, whether the relevant Databases are central or individual.
2. **SEQUENCE DIAGRAM: PATH REQUEST**

2.1 Sequence diagram path request

This Diagram is also valid for Open Access (RU is LRU) and OSS with IM 1 as OSS

2.2 Sequence diagram RU cancels a booked path
2.3 Sequence Diagram: Path Not Available

This Diagram is also valid for Open Access (RU is LRU) and OSS with IM as OSS.

The IM sends Path Not Available to the RU.

Together with the message Path Not Available or as soon as possible the IM sends a proposal for the booked path, which is not available. This is done with the Path Details message.

The RU confirms the Receipt Confirmation to the IM, if the required response cannot be made available in real-time.

RU confirms the Train Path Details to the IM, if it agrees.

RU can refuse the path details from the IM and sends a new path request to them.

RU cancels the previously booked path with reference to IM's Path Not Available message.
3. **SEQUENCE DIAGRAM: TRAIN PREPARATION**

This Diagram is also valid for Open Access (RU n is LRU) and OSS with IM 1 as OSS

Remark: During the train preparation also a Train Path Not Available message can occur, since this message can be send at any time between the moment the train path is contracted and the departure of the train. This is not included in this diagram.
4. **SEQUENCE DIAGRAM: TRAIN RUNNING FORECAST, EXAMPLE A**

- **Example A** according Path request scenario A(a) and A(b) (see chapter 1.3)
With:  
3 = Train Running Forecast  
4 = Train Running Information

---

Train preparation at station A

After leaving A:
IM1 sends train running information to RU1
And
IM1 sends train running forecast ETH for B to IM2 and RU1.

When arriving at B
IM1 sends train running information to RU1
After leaving B:
IM2 sends train running information to RU1
And
IM2 sends train running forecast for C to RU1.

When arriving at C
IM2 sends train running information to RU1.

Train preparation at Handling point C.

When leaving C:
IM2 sends train running information to RU1
And
IM2 sends train running forecast ETH for D to IM3 and RU1.

---

When arriving at B
IM1 sends train running information to RU1
After leaving B:
IM2 sends train running information to RU1
And
IM2 sends train running forecast for C to RU1.

When leaving C:
IM2 sends train running information to RU1
And
IM2 sends train running forecast ETH for D to IM3 and RU1.
With: 3 = Train Running Forecast  4 = Train Running Information
Example B according Path request scenario B (see chapter 1.3)

In this example:
RU 1 is the LRU to co-ordinate the involved RUs.

Each RU must know its neighbour RU. This information must be given by the LRU

With: 3 = Train Running Forecast  4 = Train Running Information
Train preparation at Interchange Point C done.

When leaving C:
IM2 sends train running information to RU1

And
IM2 sends train running forecast ETH for D to IM3 and RU2

When arriving at D:
IM2 sends train running information to RU2.

When leaving D:
IM3 sends train running information to RU2

When arriving at E:
IM4 sends train running information to RU3.

When leaving E:
IM4 sends train running information to RU3

And
IM4 sends train running forecast TETA for F to RU3

When arriving at F:
IM4 sends train running information to RU3

With:
3 = Train Running Forecast
4 = Train Running Information
5. **Sequence Shipment ETI / ETA**

This Sequence is based on the following example for the interchange point C.
Remark: ETA for the wagons 1&2 is the ETI at F plus the time for delivery at customer siding according to commitment.
ETA for the wagons 3,4,5 is the ETI at E plus the time for delivery at customer siding according to commitment.
6. **SEQUENCE DIAGRAM: WAGON MOVEMENT/INTERCHANGE REPORTING**

The following Sequence diagram refers to figure 14 (Example 1, ETI Calculation) and considers the handling for the wagon Numbers 1 and 2.

[Diagram of Sequence Diagram]

- **IM 2**
  - Train Running Information
  - Train running forecast for C

- **RU 1**
  - Wagon receive notice
  - Wagon interchange Notice

- **RU**
  - Yard arrival
  - Wagon ETI for C
  - Wagon delivery notice

- **LRU**
  - LRU tells RU1 wagon is ready for pick up.
  - RU1 informs LRU, that wagon has been picked up
  - RU1 informs RU2: wagon arrived at the yard point A
  - After receipt of the train running information, the RU1 informs the LRU, that the wagon has left the yard point A.

- **Possible Exception message**
  - Yards reception notice

- **Train running forecast**
  - When the wagon has arrived at the yard of the RU1 at point C, the RU1 sends yard arrival to LRU and wagon interchange notice to RU2, RU2 accepts the wagon with wagon receipt notice.

- **When arriving destination F:**
  - Wagon arrival notice
  - Wagon delivery notice

- **Only as reminder**

- **When arriving destination F:**
  - Wagon arrival notice
  - Wagon delivery notice

- **When the wagon has arrived at the yard of the RU2 at point F, the RU2 informs the LRU.**
  - When the wagon has been placed at consignee's sidings, the RU2 informs the LRU. This delivery may be confirmed by the RU2 sending the wagon delivery notice a second time with the customer identification.
END OF DOCUMENT