



European Association for Railway Interoperability
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The Trans-European Conventional Rail System

**“TELEMATIC APPLICATIONS”
subsystem for Freight Services**

**FIGURES AND SEQUENCE DIAGRAMS
OF THE
TAF TSI MESSAGES**

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ED	Date	MTNR	Author	Approved

History

ED	Date	Author	Change Reason
1.0	22.06.2004	R.Berger	Takeover from Draft TAF TSI as autonomous AEIF document

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:

Any new version of the document incorporated in any new version of annex E of the TAF TSI approved by the EC in accordance of the procedure set out in Article 21(2) of the Directive 2001/16/EC shall be distributed to:

AEIF	AEIF SSG Telematic Applications	Brussels
EC	DGTREN	Brussels
European Railway Agency	As soon as it will be created	Valenciennes

The document shall be distributed by e-mail in MS-Word format or in PDF Format and published on the AEIF Web-site www.aeif.org.

Configuration Management:

Any change requests on the content of this document shall be reported to the TAF TSI responsible member at AEIF and at 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. Standards and Guidelines

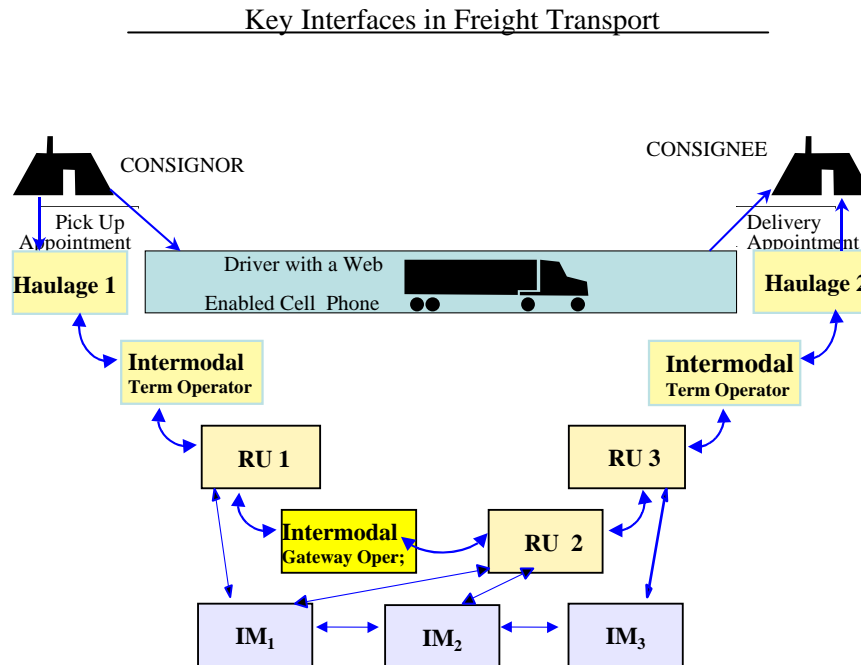
Id	Title	Doc ID, Edition	Date	Author / Publisher
1	On the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification	Directive 2001/14/EC	26/02/01	EC
2	On the interoperability of the Trans-European conventional rail system	Directive 2001/16/EC	19/03/01	EC

0.2.2. Other References

Id	Title	Doc ID, Edition	Date	Author / Publisher
1	Conventional Rail TSI Telematic Applications for Freight	TAF_TSI_V20_document_22-06-2004.doc Version 2.0	22/06/04	AEIF
2	CR Telematic Applications for freight: Data Definitions and Messages	AEIF_TAF_MesData_V10_040322.doc Version 1.0	22/03/04	AEIF
3	CR Telematic Applications for freight: The Infrastructure Data and the Rolling Stock Data	AEIF_TAF_DbsData_V10_040322.doc Version 1.0	22/03/04	AEIF
4	CR Telematic Applications for freight: Glossary (English)	AEIF_TAF_Glossary_V10_040622.doc Version 1.0	22/03/04	AEIF

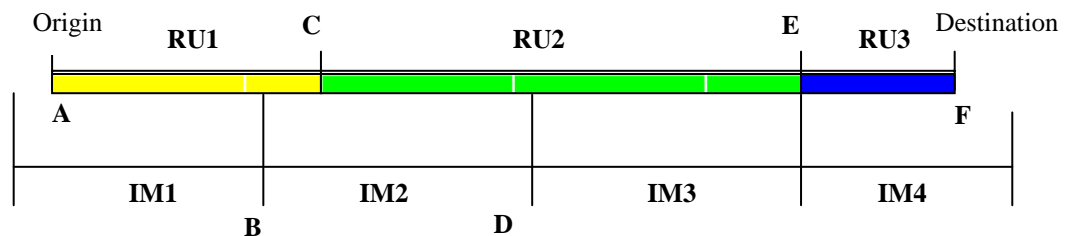
1. Figures

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:

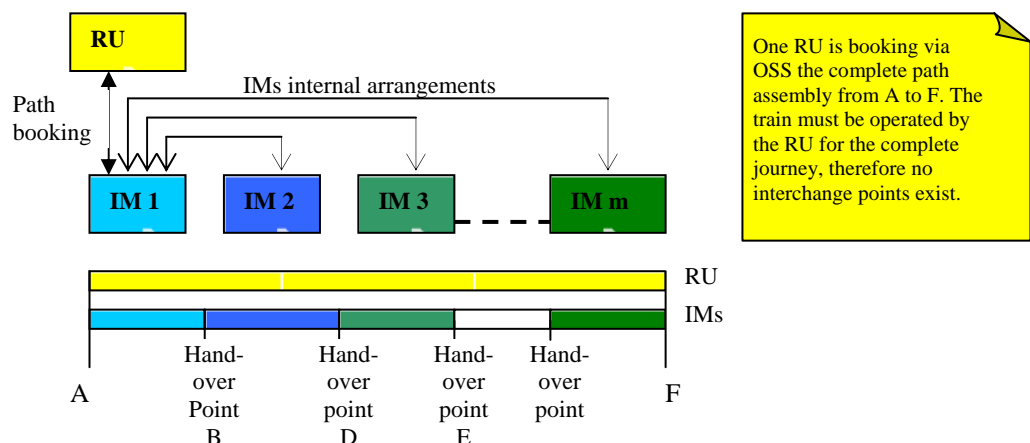
*For the journey section A-B, IM1 communicates with RU1;
 For the journey section B-C, IM2 communicates with RU1;
 For the journey section C-D, IM2 communicates with RU2;
 For the journey section D-E, IM3 communicates with RU2;
 For the journey section E-F, IM4 communicates with RU3.*

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.

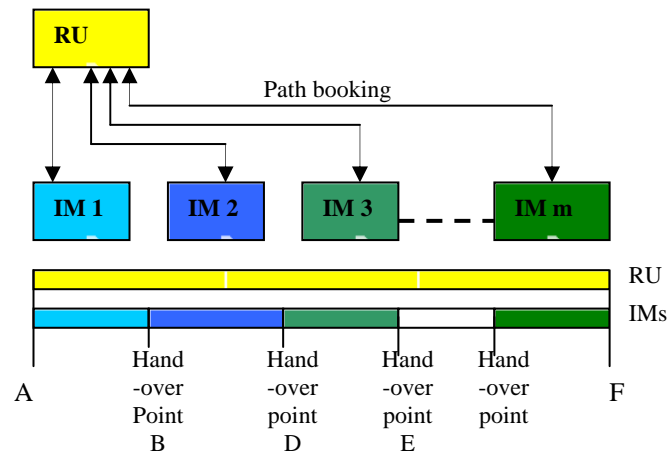
1.3. Scenarios for path booking

- **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



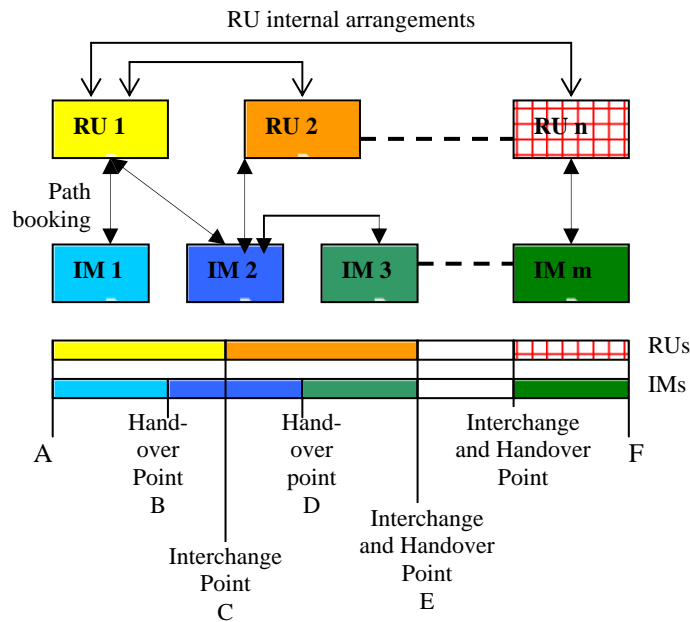
b) Direct path booking by the RU for Transport Journey from A to F



One RU is booking directly from the various IMs the several paths from A to F - section by section - between two handover points. The train must be operated by the RU for the complete journey, therefore no interchange points exist.

- **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

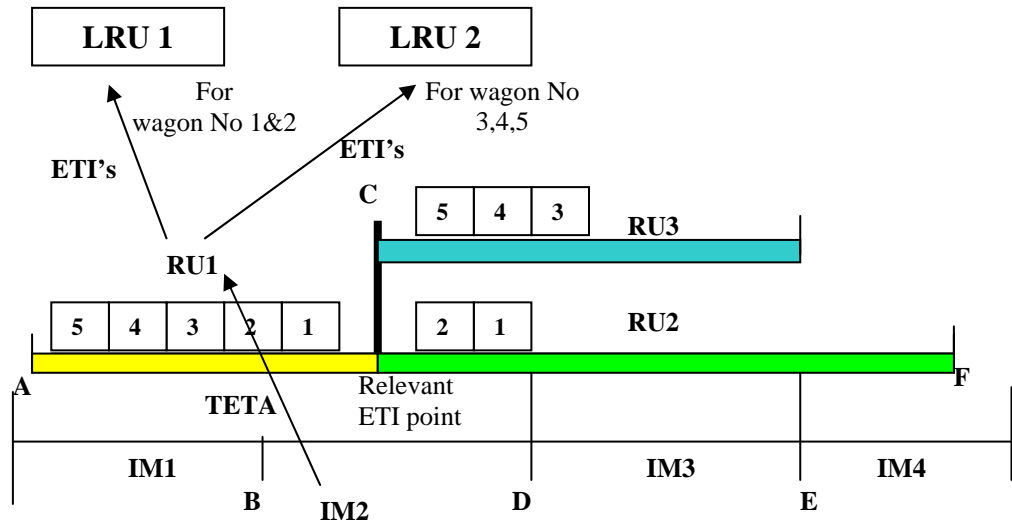


Various RUs request from the various IMs or via OSS only the path(s) for a journey section between two interchange points of the complete journey for a train from A to F. The RUs operate the train on its booked path. In this example RU 1 is booking the paths from A to the interchange point C directly, whereas RU 2 is booking the paths from the interchange point C to the next interchange point E via OSS.

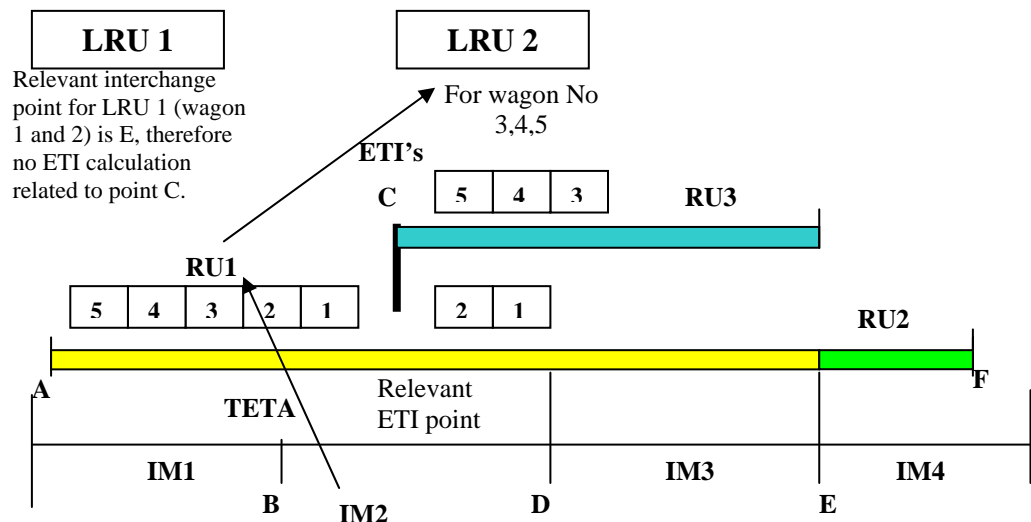
Remark: In the execution mode, the IM will always communicate with the RU which has booked the path. Therefore the “path ownership” is important for the message exchange during operation of the train.

1.4. Examples for ETI calculation

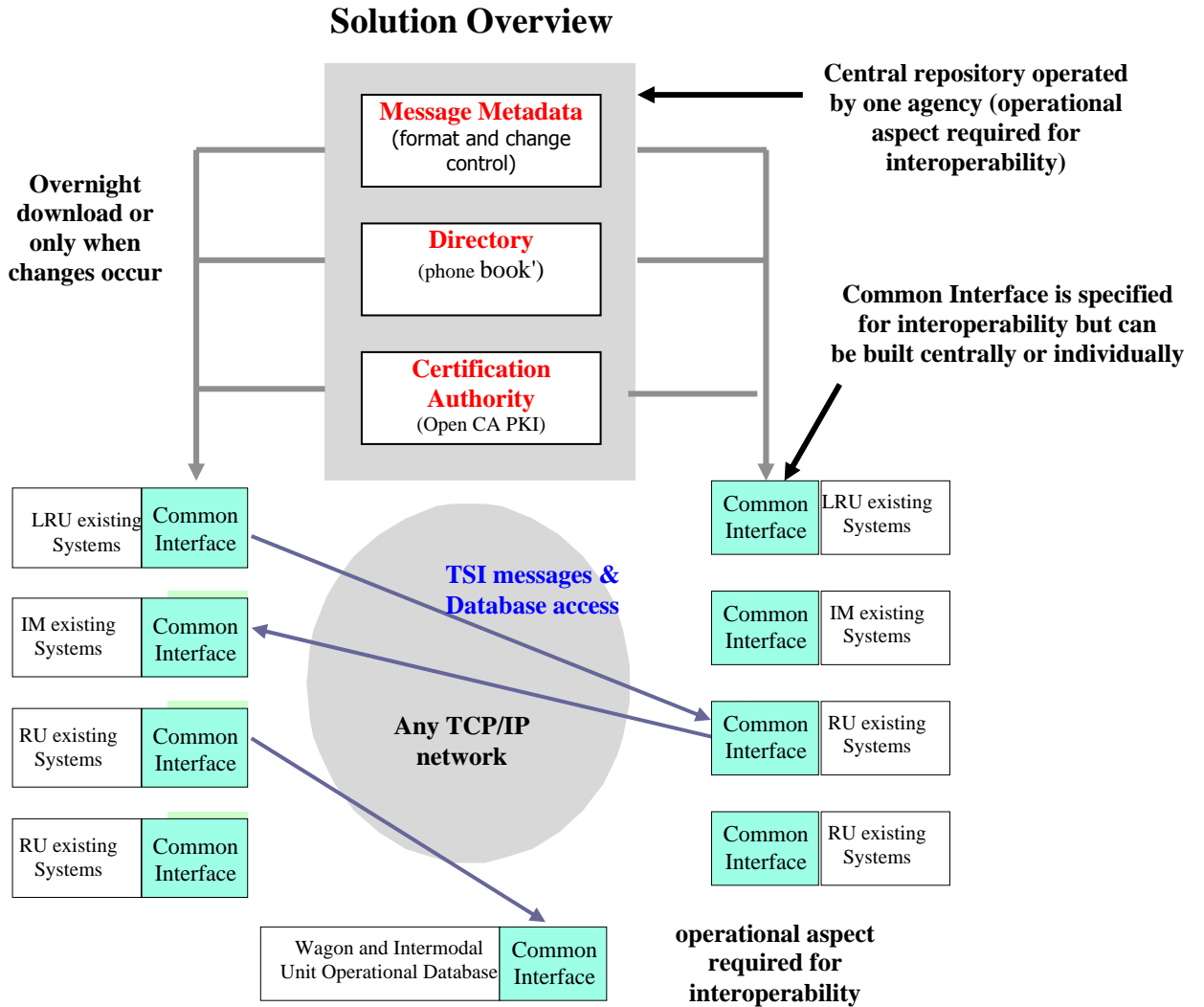
Example 1 for calculation of an ETI for LRU 1 and LRU 2 based on TETA from IM2 for interchange point C:



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

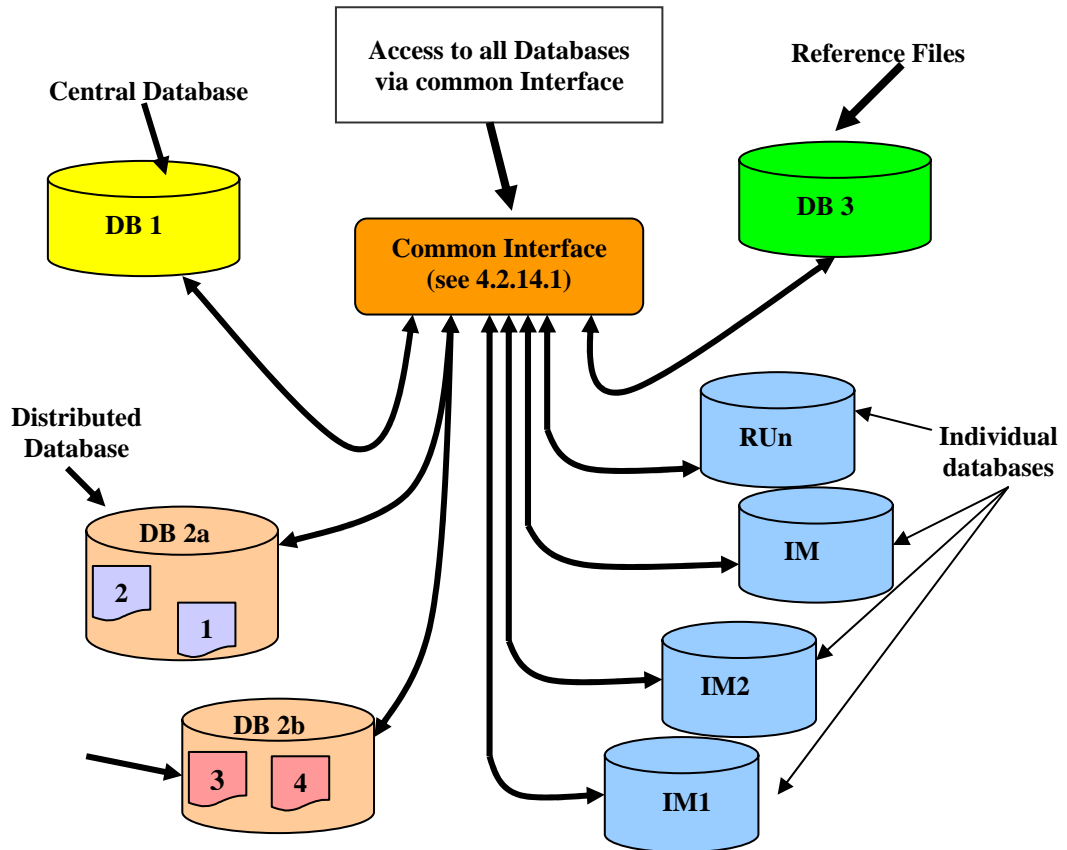


1.5. General Architecture Solution Overview



1.6. Access method to the different types of Databases using the common interface

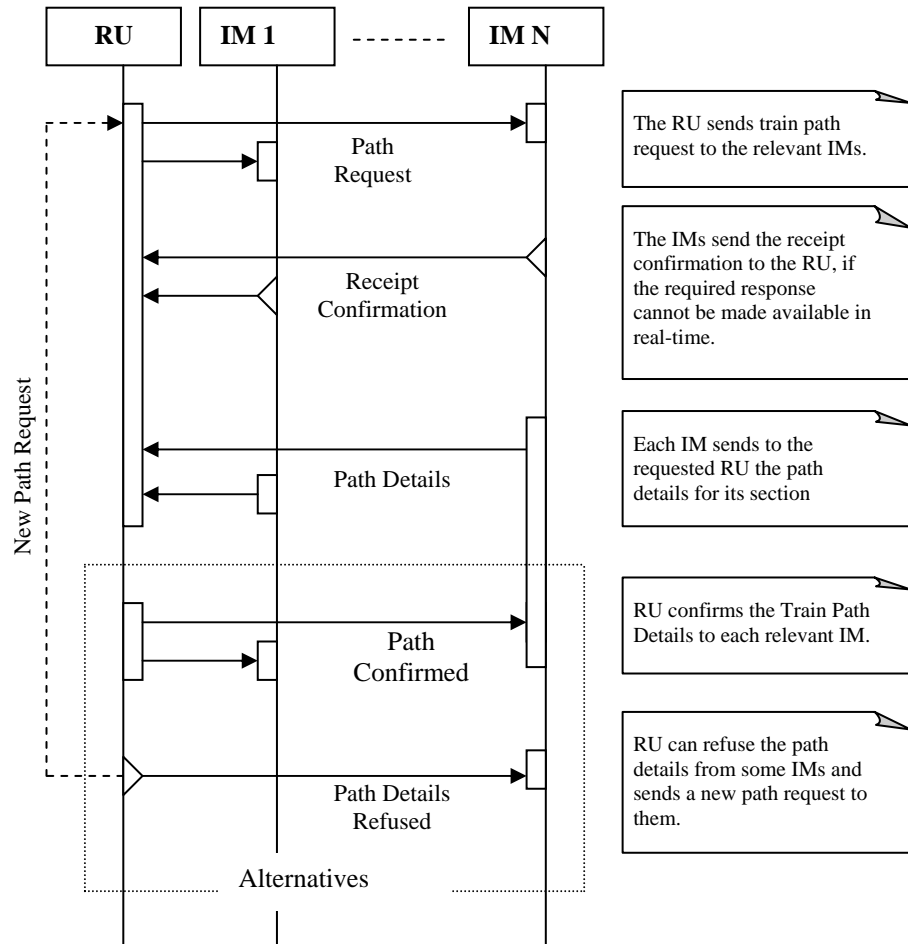
Each instance of the Common Interface will have access to all the data required according the TSI within each RU, IM, etc, whether the relevant Databases are central or individual.



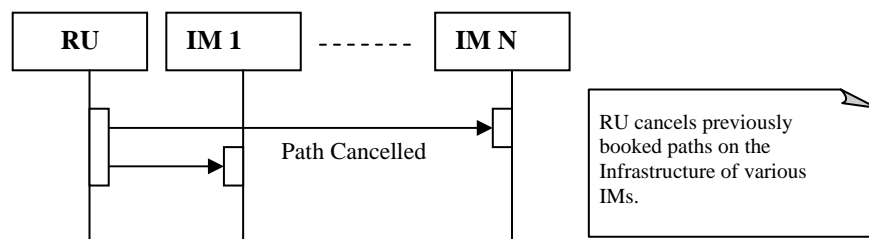
2. Sequence Diagram: Path request

2.1. Sequence diagram path request

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

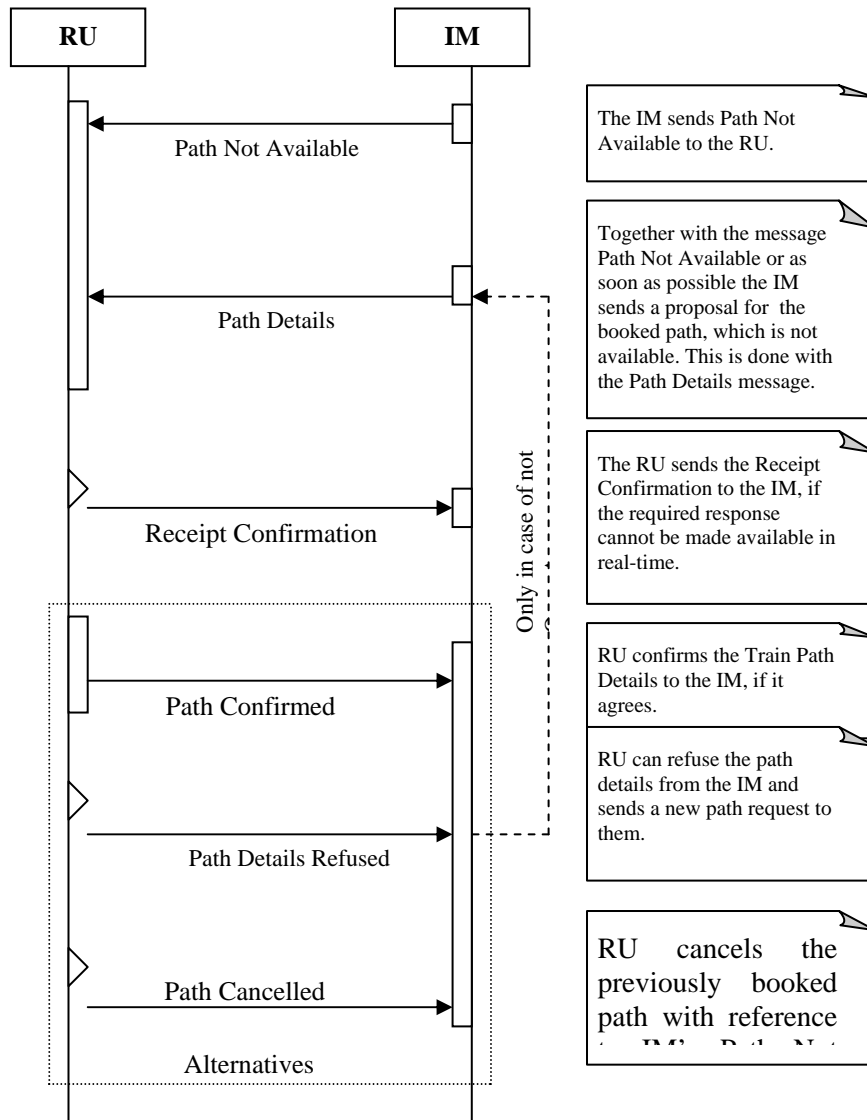


2.2. Sequence diagram RU cancels a booked path



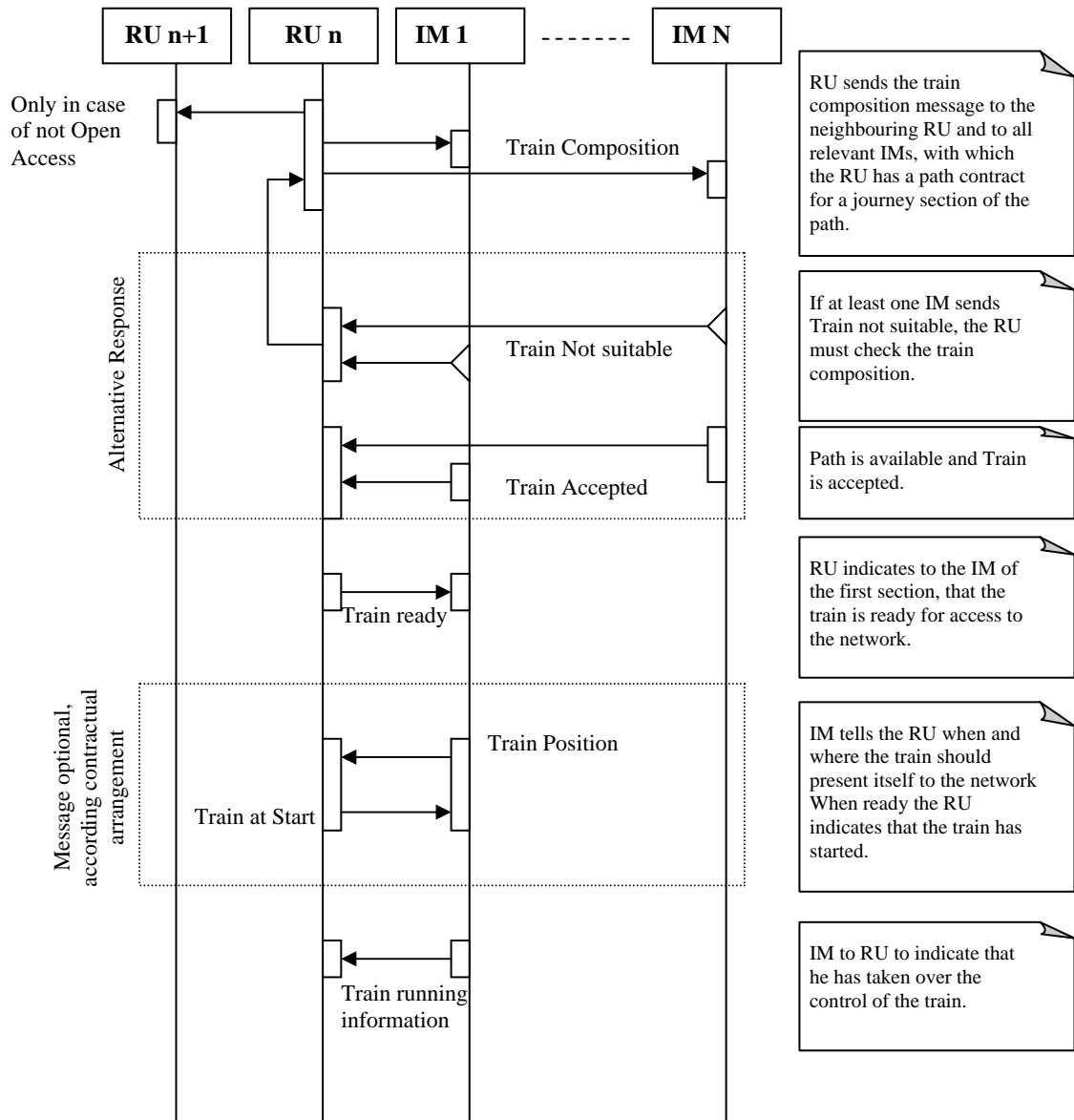
2.3. Sequence Diagram: Path Not Available

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



3. Sequence Diagram: Train Preparation

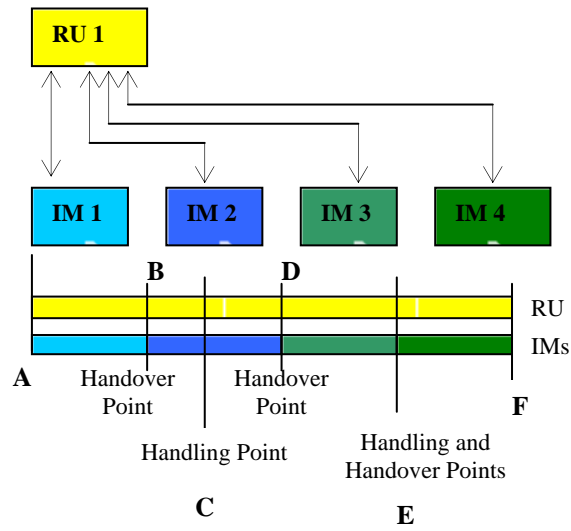
This Diagram is also valid for Open Access (RU n is LRU) and OSS with IM 1 as OSS



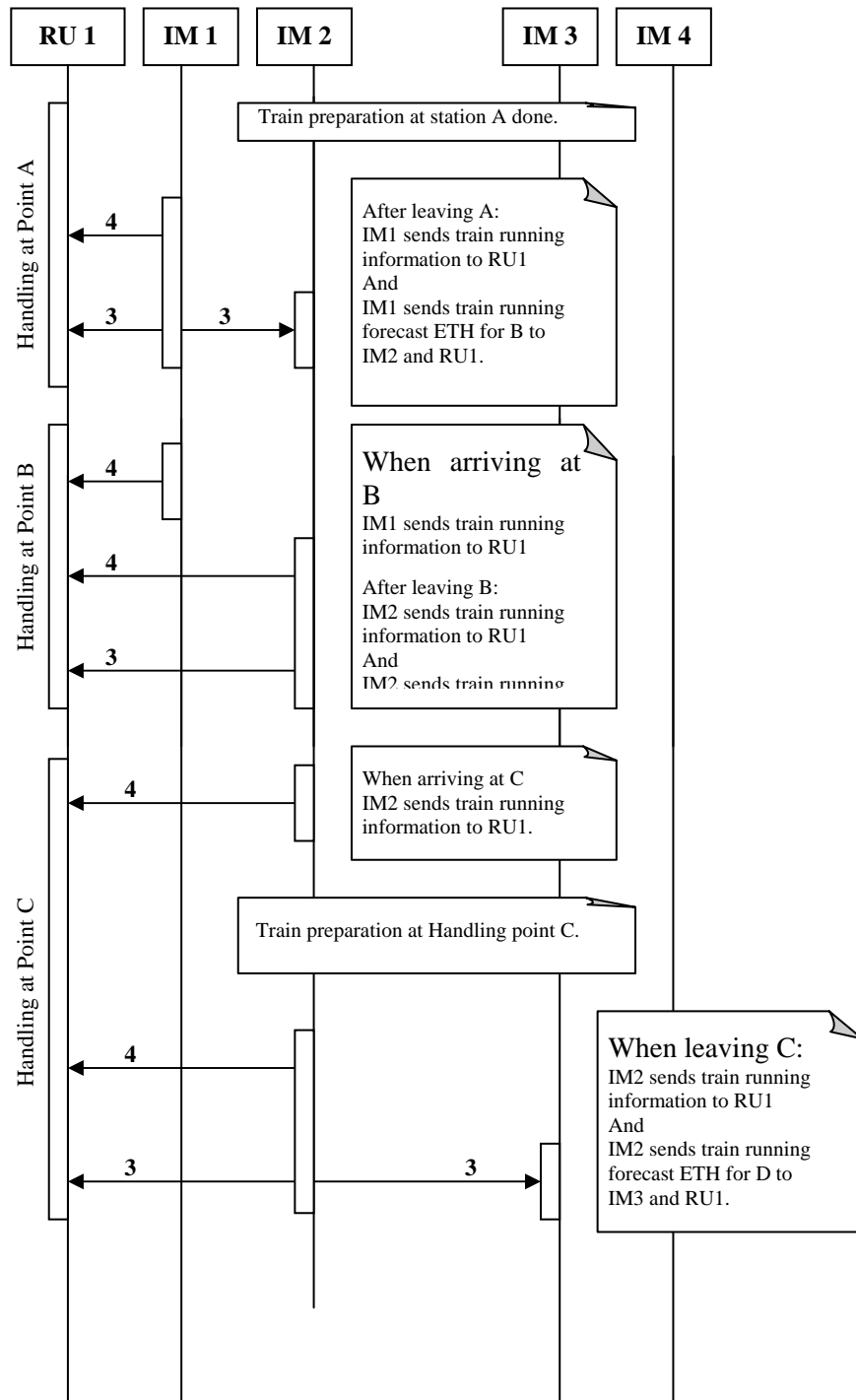
Remark: During the train preparation also a Train Path Not Available message can occur, since this message can be send at any time between the moment the train path is contractured and the departure of the train. This is not included in this diagram.

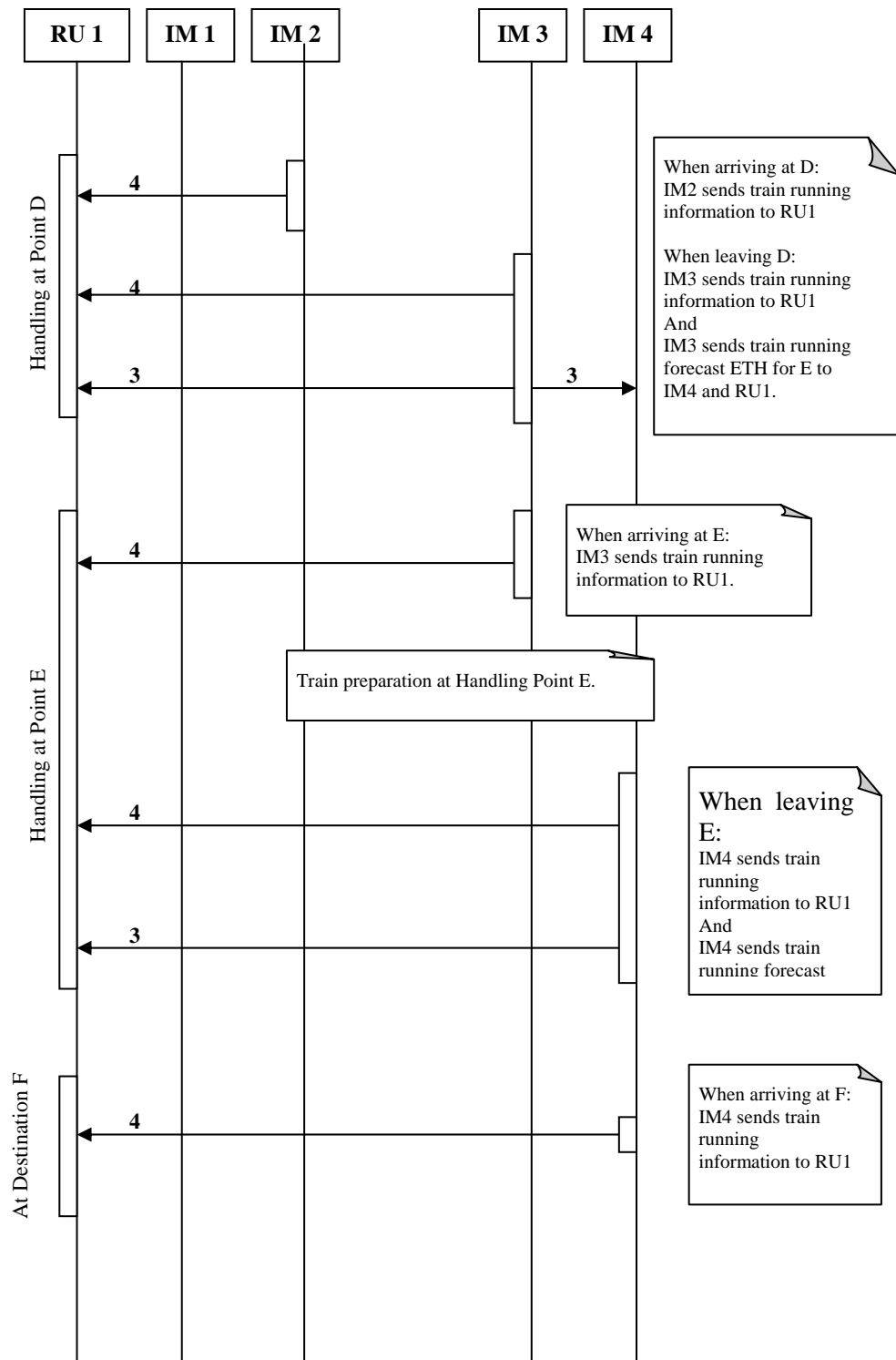
4. Sequence diagram: Train running forecast, example A

- **Example A** according Path request scenario A(a) and A(b) (see chapter 1.3)



With: 3 = Train Running Forecast 4 = Train Running Information

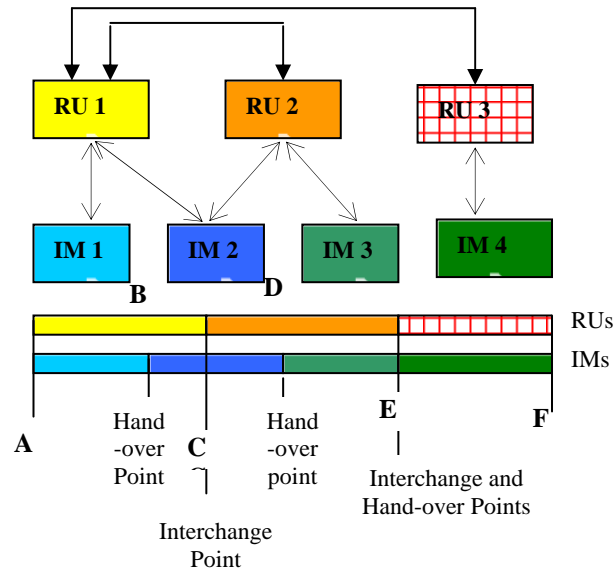




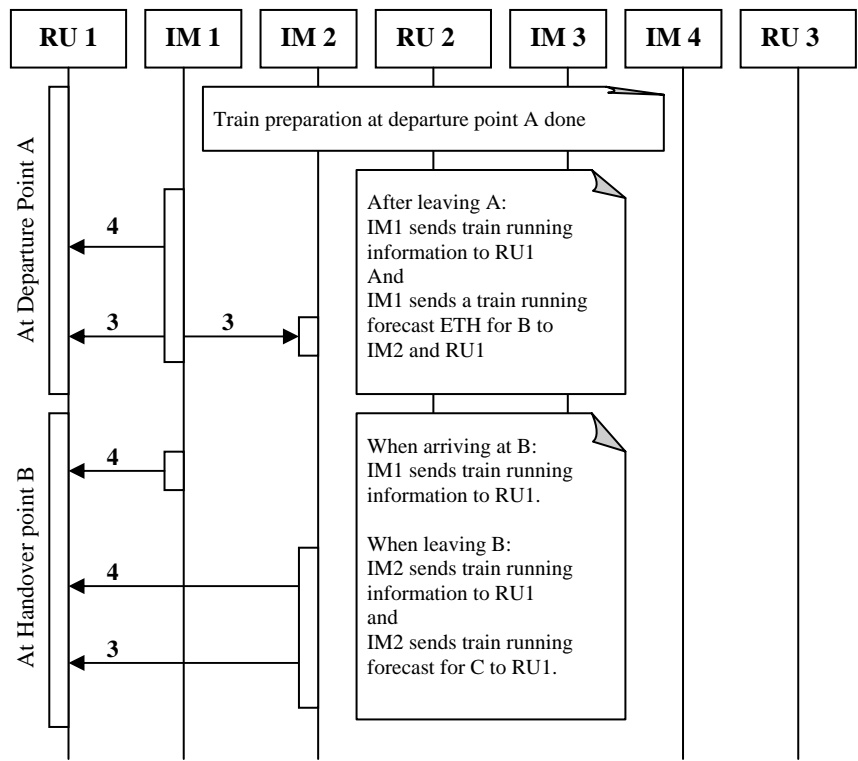
With: 3 =Train Running Forecast 4 = Train Running Information

- **Example B** according Path request scenario B (see chapter 1.3)

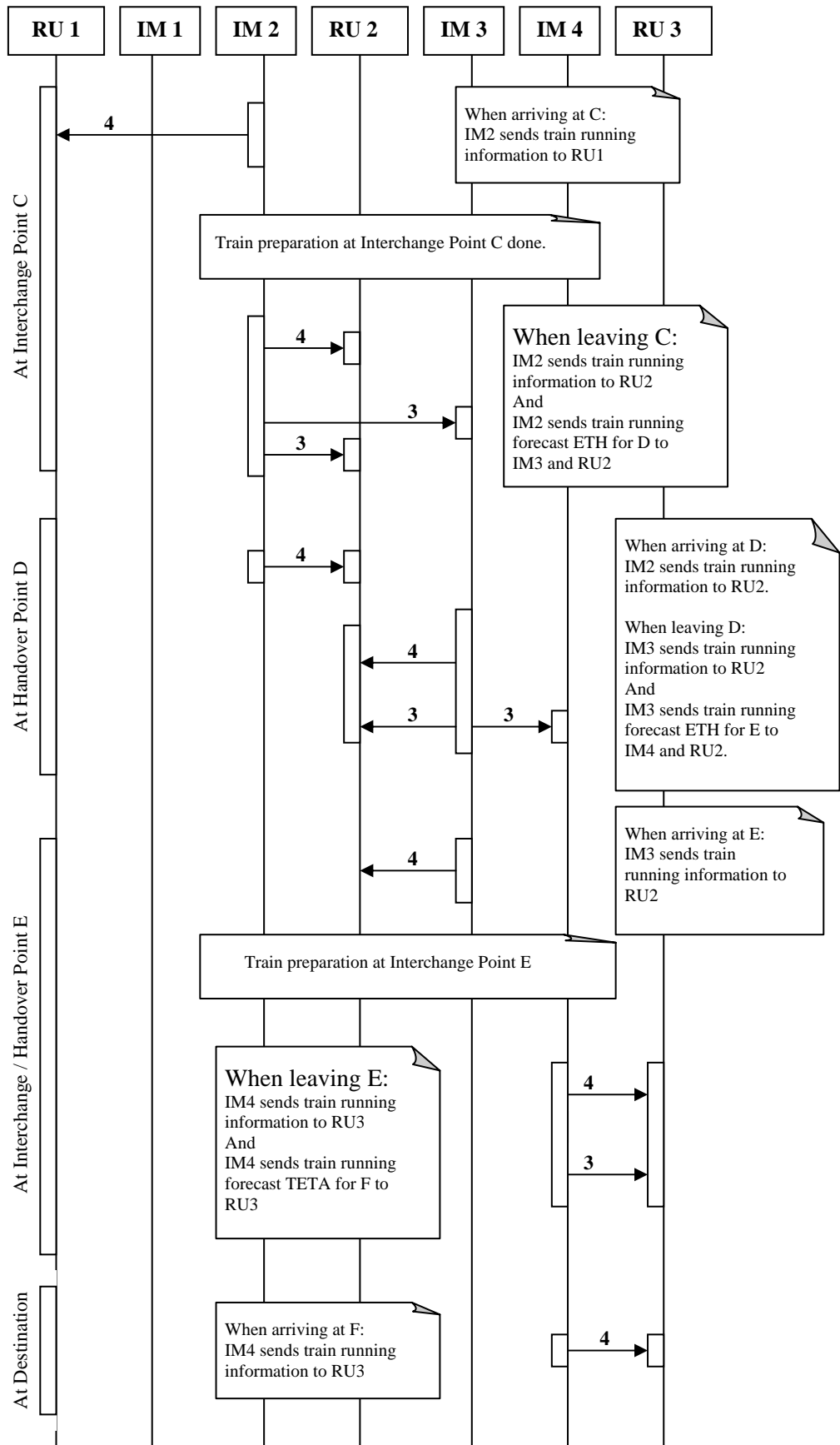
In this example:
RU 1 is the LRU to co-ordinate the involved RUs.



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



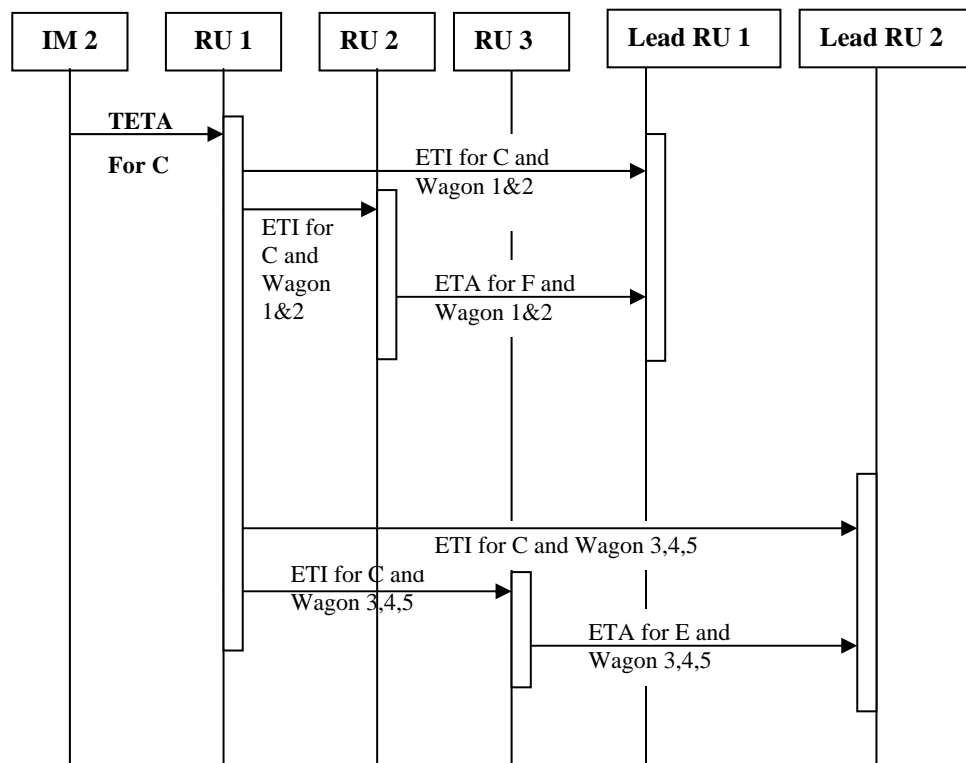
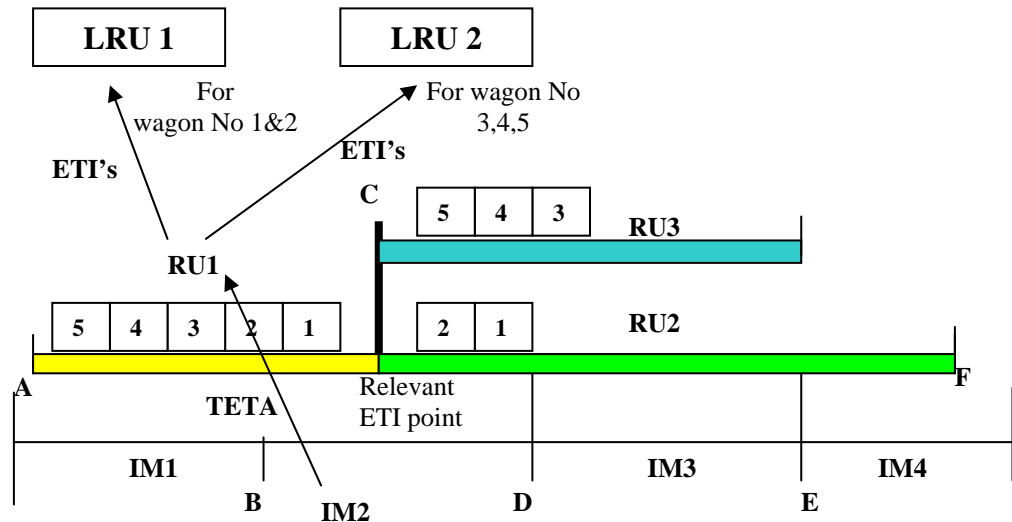
With: 3 = Train Running Forecast 4 = Train Running Information



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.

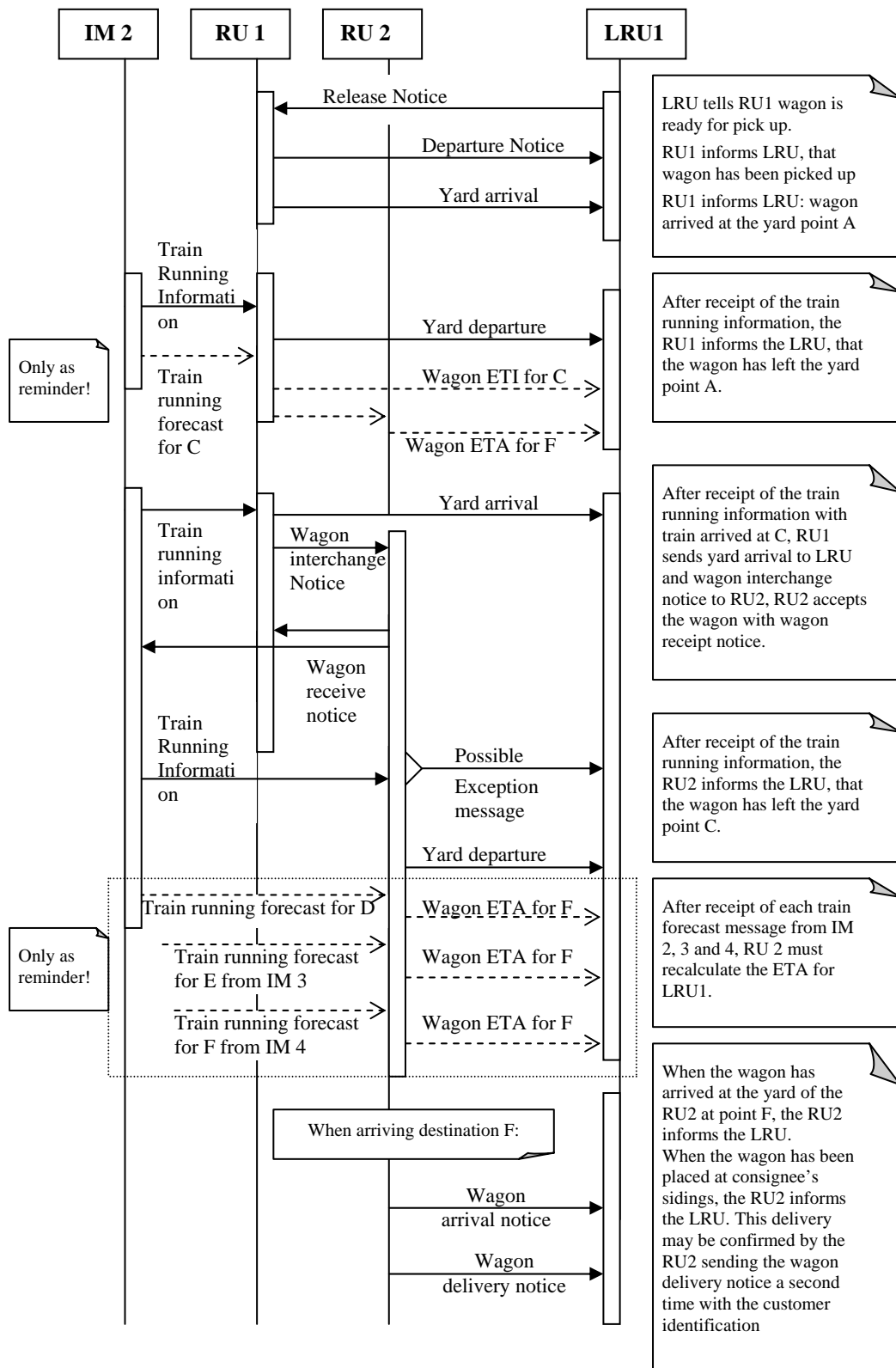


Remark: ETA for the wagons 1&2 is the ETI at F plus the time for delivery at customer siding according to commitment.

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.



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