

# Annex 13.2:

## Business Cases Operations

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## 1. Business Cases

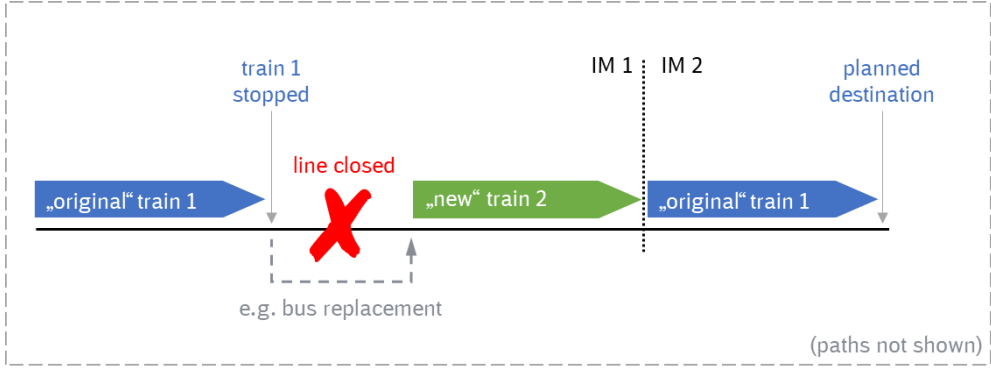
The below procedures are intended for incident management in “hot operations” when time, capability, workload, etc. do not allow to follow the formal planning procedures laid down in the TAF/TAP framework. In principle, it is preferable to handle situations like the below using planning procedures. This should be done if possible.

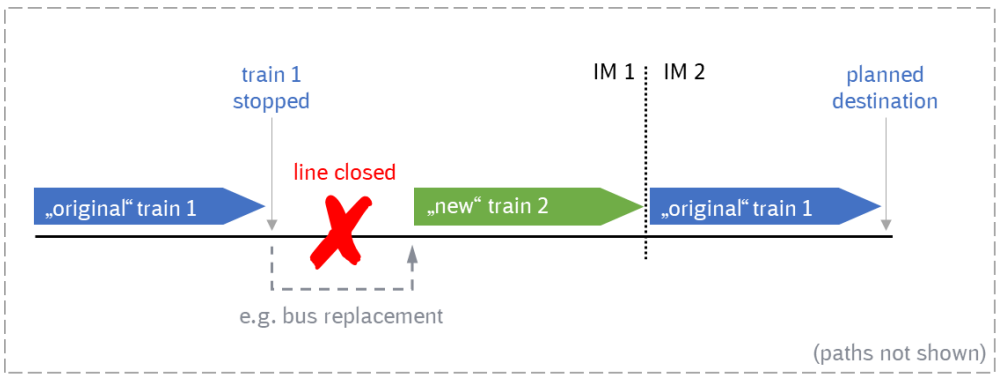
Whenever TAF/TAP-Identifiers are mentioned in the business cases, daily-objects and daily-identifiers (including the start date) are meant.

### Abbreviations

- IM = Infrastructure Manager
- MS = MessageStatus (element in all messages)
- PD = PathDetails message
- PSN = PathSectionNotification message
- RU = Railway undertaking
- SM = Station Manager
- TCM = TrainComposition message
- TDC = TrainDelayCause message
- TRF = TrainRunningForecast message
- TRI = TrainrunningInformation message
- TRInt = TrainRunningInterruption message
- TOI = TypeOfInformation (element in PD, PSN messages)
- TOR = TypeOfRequest (element in PD, PSN messages)

### 1.1. Train run is split

<b>Situation</b>	<p>Train run terminates before reaching its planned destination for example due to an unscheduled line closure (effects of a thunderstorm or the like). For the part of its journey, on which the “original” train is no longer running, it is replaced by another “new” train, which needs an own TrainID and (depending on the use case) PathID.</p> 
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1. ResponsibleRU and IM coordinate by other means than TAF/P-messages (telephone, pre-planned scenarios, etc.) and decide for the course of action described above (alternatives could be rerouting, cancellation, etc.).</li> <li>2. <b>Option A: IDs are kept</b> If the green train will not start before the blue train has arrived, TrainID and PathID may be kept (the TrainID is “handed” from the blue to the green train).</li> <li>2. <b>Option B: New IDs needed</b> If a new TrainID and PathID is assigned: <ol style="list-style-type: none"> <li>3. IM sends <i>PathSectionNotification</i> message [<i>MS: Creation(1)</i>, <i>TOR: optional element not applicable</i>; <i>TOI: deactivate path (51)</i>] for the part of the path of the original (blue) train, that is not used.</li> <li>4. In general, a new TrainID is to be created by the ResponsibleRU, as it is the owner of the train object. If the available time, workload, capability, etc. does not allow this, the allocation of the TrainID may be done by the IM on behalf of and in agreement with the ResponsibleRU according to pre-defined rules (e.g. a set of TrainIDs defined by the ResponsibleRU for that purpose).</li> <li>5. IM creates path and PathID for the new (green) train.</li> <li>6. IM sends <i>PathDetails</i> message [<i>MS: Creation(1)</i>, <i>TOR: Modification (3)</i>; <i>TOI: booked(22)</i>] for new (green) train with the new TrainID and PathID. The old TrainID and PathID (of the blue train) will be added in the RelatedIdentifier section of the <i>PathDetails</i> message.</li> <li>7. No <i>PathConfirmed</i> message for acceptance of the new path by ResponsibleRU is necessary, because it has already accepted in step 1.</li> <li>8. Normal procedures apply for train preparation and for the run of the new train (TrainComposition, TrainRunning messages, etc.).</li> </ol> </li> </ol>
<b>Interoperable/ international perspective</b>	<p>The above described procedure will work within one network. However, if the green train is interoperable and passes <b>onto another network</b>, the challenge of handling the change of the TrainID arises – i.e. the next IMs and RUs expect TrainID of the blue train (<i>TrainRunningForecast</i> message, etc.) and not the TrainID of the green train).</p> <p>TrainID 2 (green) is therefore only used on the network of IM 1. On the network of IM 2 and all further networks, the train runs with TrainID 1 (blue).</p> <p>In the train running messages concerning the second (green) train, IM 1 puts TrainID 2 (green) into the identifier section and TrainID 1 (blue) into the related identifier section. This includes the <i>TrainRunningForecast</i> message to IM 2.</p>

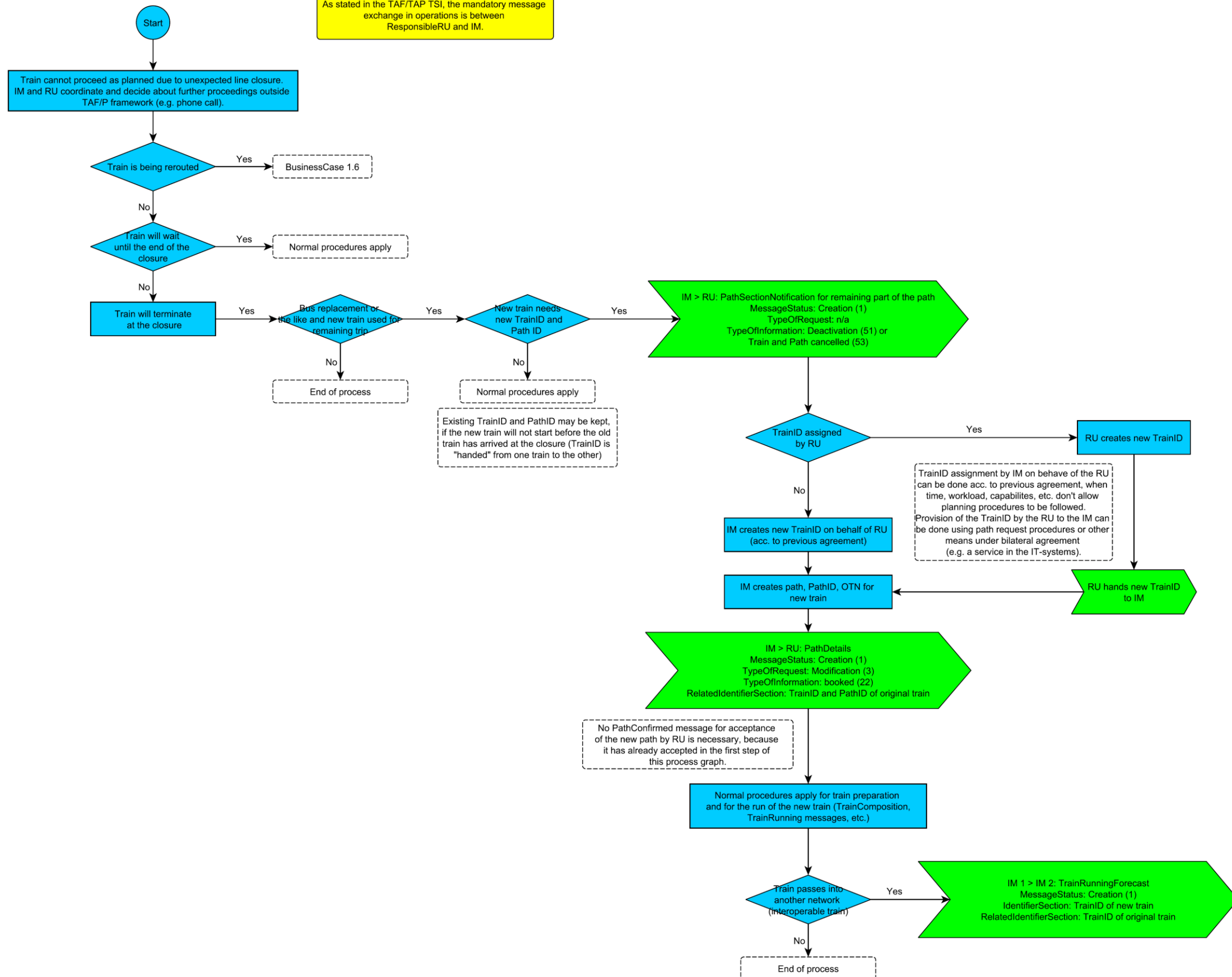
	
<b>Remark</b>	<p>While updating the TrainID in the systems of all subsequent actors (next IMs, next RUs, SMs) is in theory an option, it would create a huge complexity as this would need to happen within minutes into all depth of the systems (information on connecting services, related Identifier sections, all systems of all actors using the ID, etc.).</p> <p>The risk of some actor downstream of the incident not updating the ID in its system and the resulting confusion has been deemed as too high and unnecessary. Therefore, the above described solution, which confines the change to the network of one IM, has been decided on. Furthermore, even if one actor cannot execute the readout of the related Identifier section, the damage is limited as (in most cases) only the forecast message from the preceding actor will be lost while the rest of the system and linkage of the identifiers remains stable. Updating the TrainID on the other hand would require actions by all actors and create heavy damage if that's not possible.</p>

### Business Case 1.1: Train run is split

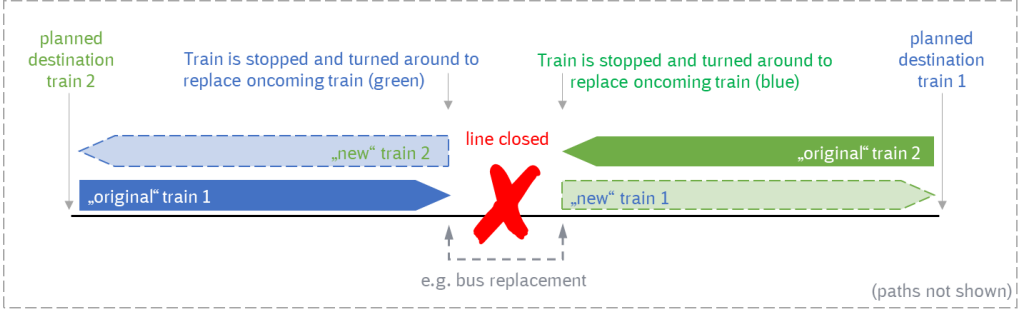
Process is used for Business Case 1.2 (Train is turned around) in an analogous manner.

The described procedure is intended for incident management in "hot operations" and does not replace the procedures used in planning.

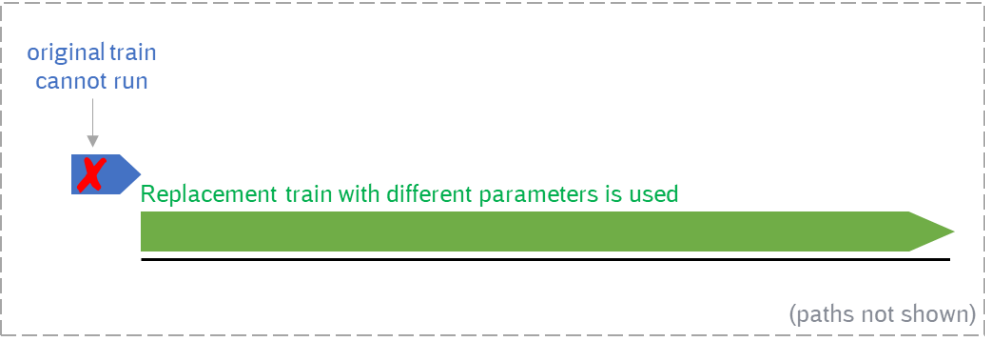
As stated in the TAF/TAP TSI, the mandatory message exchange in operations is between ResponsibleRU and IM.



## 1.2. Train is turned around

<b>Situation</b>	<p>Situation as in 1.1 but the train is turned around and used for the service of an oncoming train, which also cannot run on that part of its planned journey due to the line closure. The same thing may happen on both sides of the line closure.</p>  <p>The diagram shows a horizontal line representing a railway track. A red 'X' in the center indicates a 'line closed' section. To the left of the closure, a blue arrow labeled '„original“ train 1' points right towards the closure. Above it, a dashed blue arrow labeled '„new“ train 2' points left away from the closure. To the right of the closure, a green arrow labeled '„original“ train 2' points left towards the closure. Below it, a dashed green arrow labeled '„new“ train 1' points right away from the closure. Above the track, text labels indicate the planned destinations: 'planned destination train 2' (green) on the left and 'planned destination train 1' (blue) on the right. Arrows point from the text 'Train is stopped and turned around to replace oncoming train (green)' to the green train and 'Train is stopped and turned around to replace oncoming train (blue)' to the blue train. Below the track, a dashed line with arrows at both ends is labeled 'e.g. bus replacement'. A note '(paths not shown)' is at the bottom right of the diagram area.</p>
<b>Procedure</b>	<p>Same procedure as described in 1.1 is applied for both trains.</p>

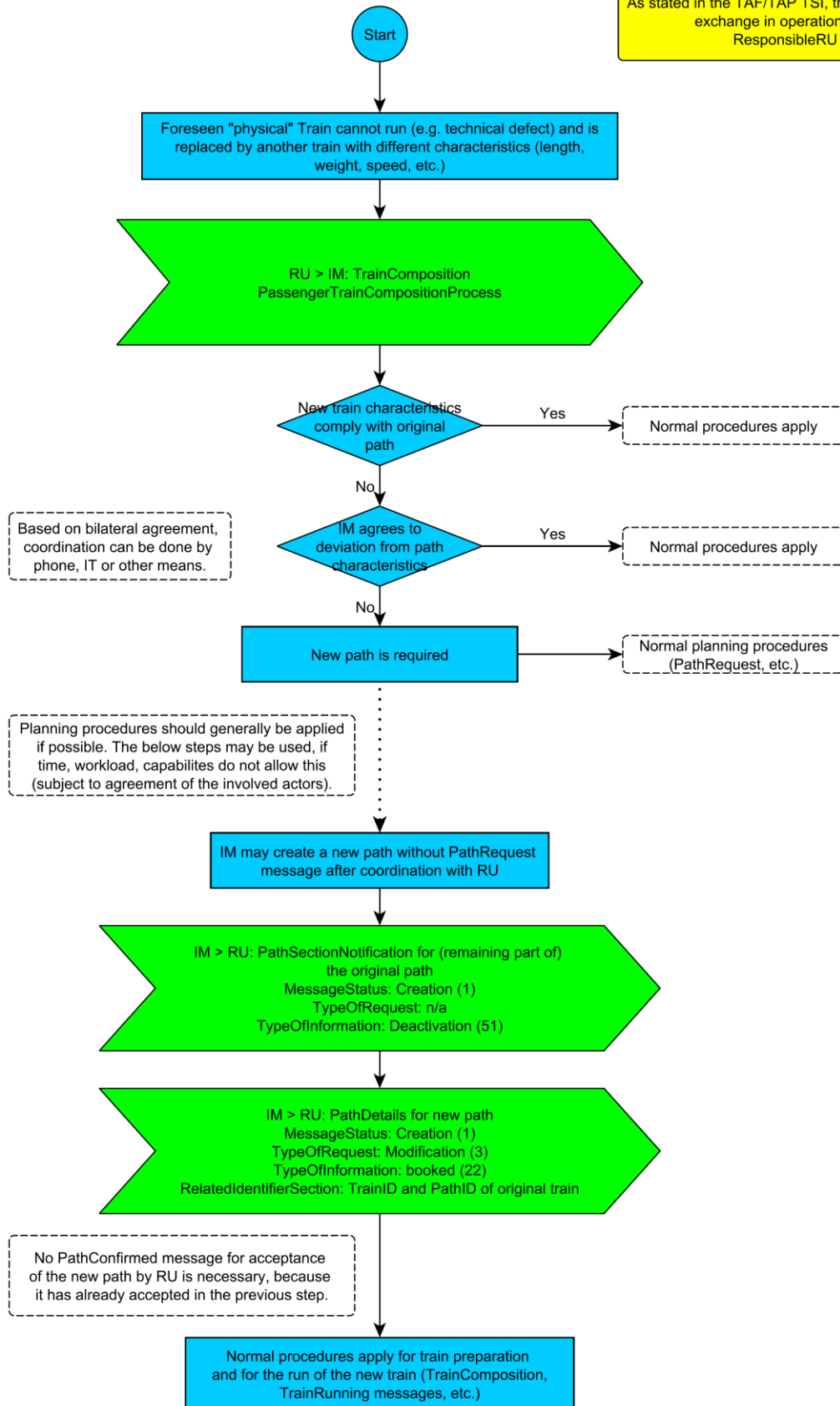
### 1.3. Train is replaced

<b>Situation</b>	<p>The originally foreseen “physical” train cannot run (e.g. due to a technical defect) and is replaced by another train with different train-parameters (length, weight, speed, etc.). For example, an ICE trainset is replaced by a “conventional” IC train.</p> <p>The same situation can also occur at an intermediate station along the route.</p> 
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1. The TrainID of the original train is used for the replacement train as well (same service). The change of trains is treated as a change to characteristics of the train.</li> <li>2. ResponsibleRU send <i>TrainComposition message</i> to IM.</li> <li>3. If the characteristics of the replacement train do not comply with the original path (and the IM does not agree to the deviation from the path characteristics), a new path might be required.</li> <li>4. Depending on the available time, the creation of that new path can be done according to the planning procedures (PathRequest) or according to the operations method described in 1.1 (IM sends <i>PathDetails message [TOI: booked(22)]</i> to ResponsibleRU). In that case, the IM sends <i>PathSectionNotification message</i> for the complete old path or not used section of the old path.</li> </ol>

### Business Case 1.3: Train is replaced

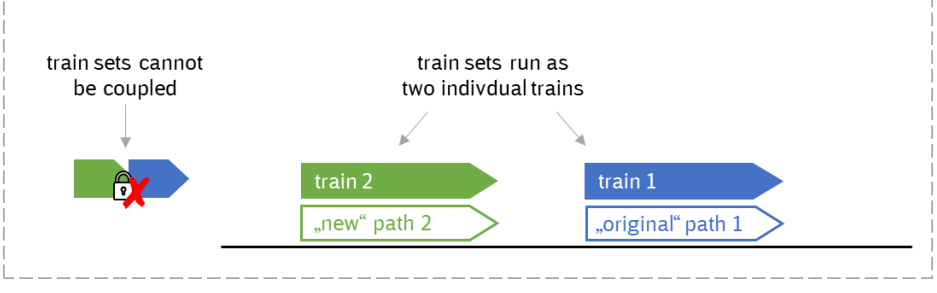
The described procedure is intended for incident management in "hot operations" and does not replace the procedures used in planning.

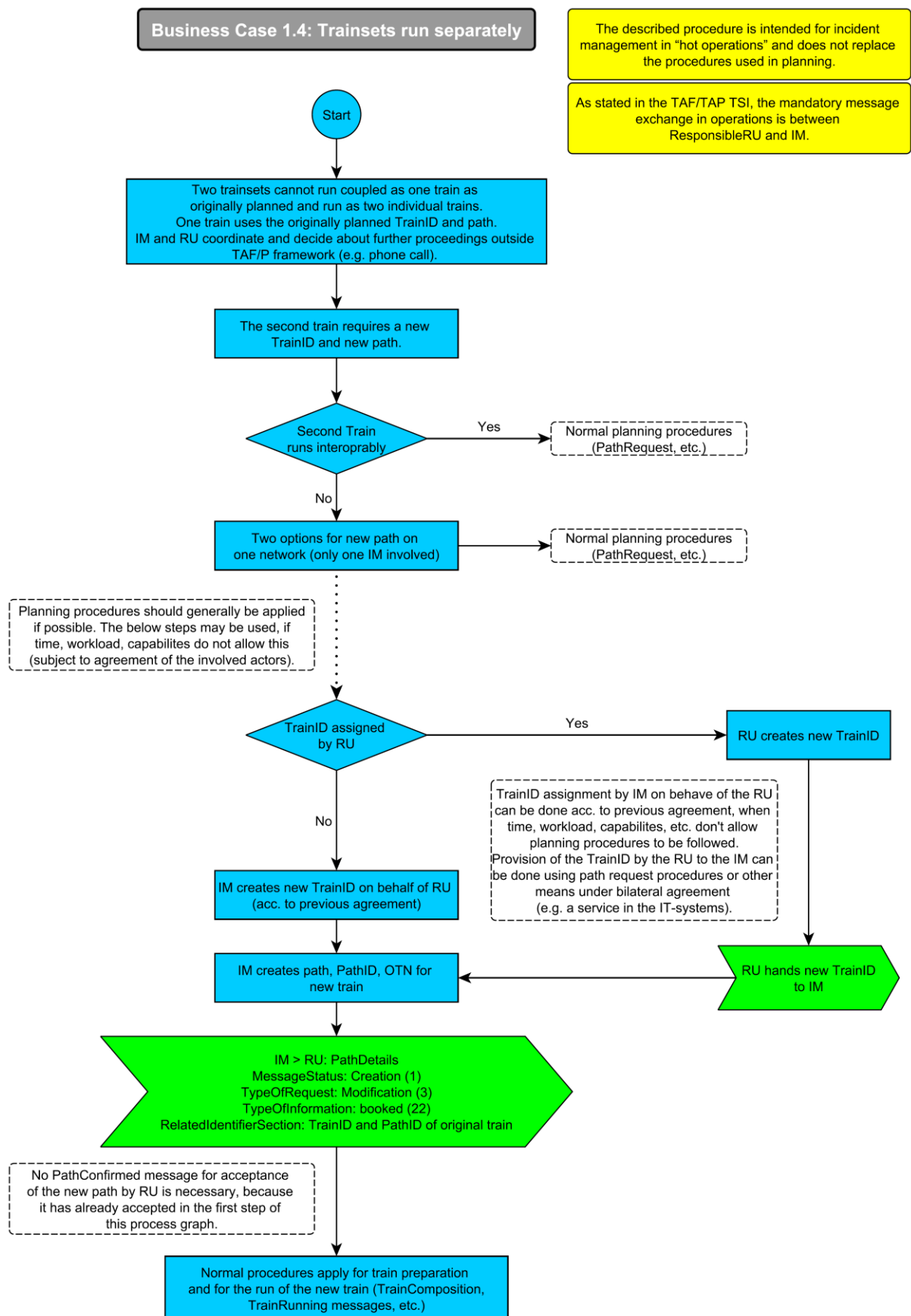
As stated in the TAF/TAP TSI, the mandatory message exchange in operations is between ResponsibleRU and IM.



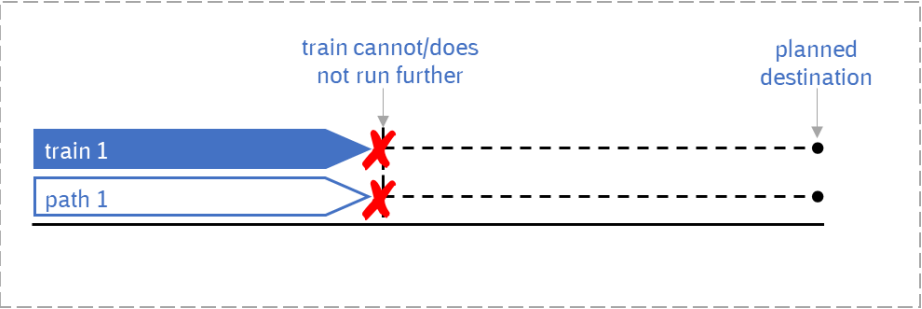


#### 1.4. Trainsets run separately

<b>Situation</b>	<p>Two trainsets of one train cannot run coupled as originally planned (e.g. due to a technical defect) and run as two individual trains.</p>  <p>The diagram illustrates a situation where two trainsets, 'train 1' (blue) and 'train 2' (green), are shown running separately. 'train 1' is on '„original“ path 1' and 'train 2' is on '„new“ path 2'. A dashed box indicates that the trainsets cannot be coupled, and arrows point to the separate paths.</p>
<b>Procedure</b>	<p><u>Assumption:</u> Both trainsets shall run (running only one trainset would otherwise also be an option).</p> <ol style="list-style-type: none"> <li>1. The first train will run with the original TrainID and on the original path.</li> <li>2. The second train requires a new path and TrainID.</li> <li>3. For interoperable running trains (running on more than one network), the normal path request procedures apply for the green train.</li> <li>4. For trains running only on one network: Depending on the available time and agreement of IM and ResponsibleRU, the creation of that new path and TrainID can alternatively be done according to the operations method described in business case 1.1 (IM sends <i>PathDetails</i> message [TOI: booked(22)] to ResponsibleRU).</li> </ol>

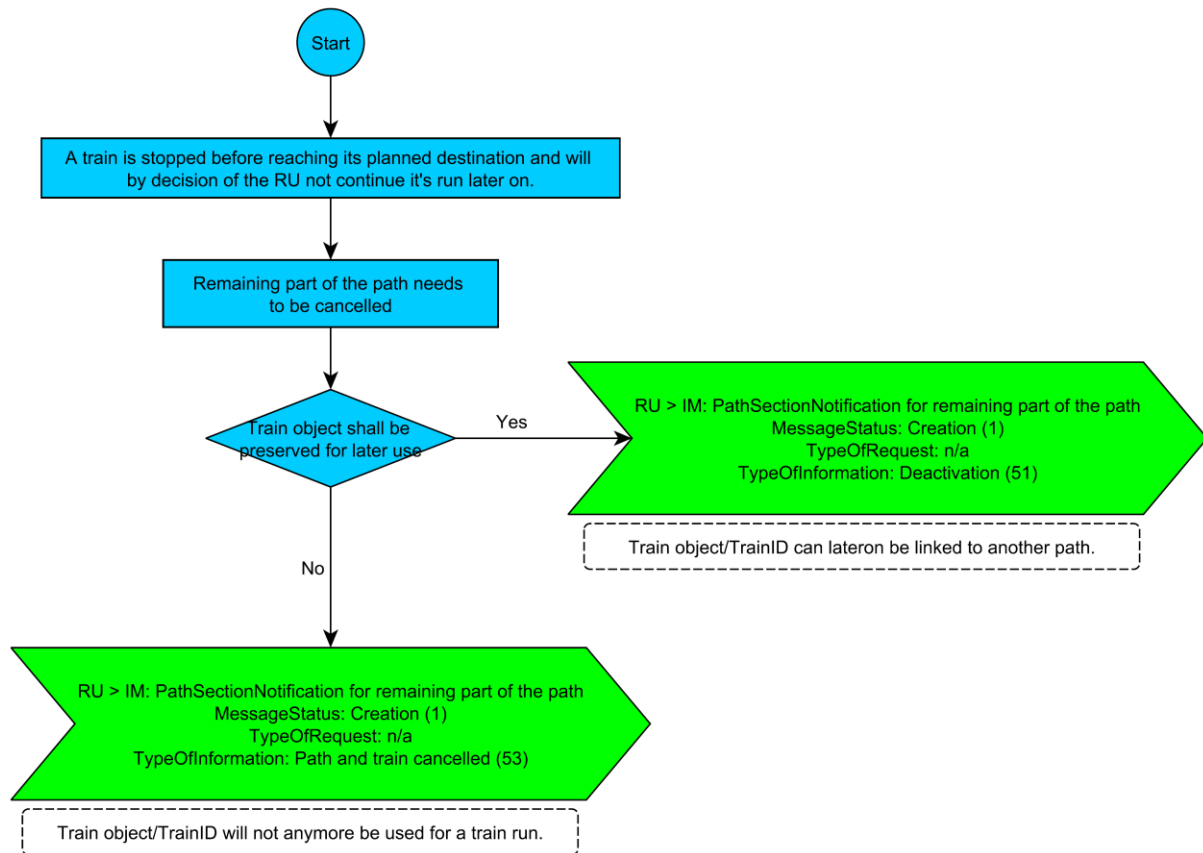


### 1.5. Train is cancelled before reaching its planned destination

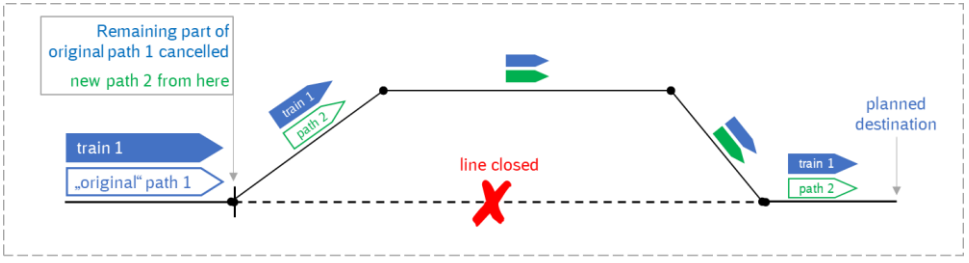
<b>Situation</b>	<p>A train is stopped and cancelled before reaching its planned destination. Frequent reasons for such an event are:</p> <ol style="list-style-type: none"> <li>1. Line is closed because of a disruption and the train is not being rerouted and does not wait until the disruption has ended.</li> <li>2. There is no disruption on the infrastructure but there is a technical defect to the train.</li> <li>3. There is no problem to the infrastructure or the train but ResponsibleRU decides not to run the train further out of other reasons.</li> </ol> <p>It is important to distinguish between the cancellation/deactivation of a path, which can also be done with the <i>PathSectionNotification</i> message and the cancellation of the path <u>and</u> the train (in essence to “kill” the train object before it reached its planned destination). Otherwise, the same train object could for example later be linked to a new path object.</p> 
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1. To “kill” the train object, <i>PathSectionNotification</i> [MS: creation (1), TOR: optional element not applicable, TOI: Path and train cancelled (53)] will be send from ResponsibleRU to IM. If the IM doesn’t need the additional information of the train being cancelled along with the path, it can treat TOI “deletion” and “Path train cancelled” alike.</li> <li>2. For international trains, the RU responsible for running the train on the next network has to inform the next IM (depending on the available time this can be the <i>PathSectionNotification</i> or planning procedures).</li> </ol>

**Business Case 1.5: Train is cancelled before reaching its planned destination**

As stated in the TAF/TAP TSI, the mandatory message exchange in operations is between ResponsibleRU and IM.



## 1.6. Train is rerouted

<b>Situation</b>	<p>An ad-hoc rerouting of a train is necessary (e.g. due to an unscheduled line closure).</p> 
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1. ResponsibleRU and IM coordinate by other means than TAF/P-messages (telephone, pre-planned scenarios, etc.) and decide for the action described above (alternatives could be splitting of the train, cancellation, etc.).</li> <li>2. TrainID remains the same.</li> <li>3. IM sends <i>PathSectionNotification</i> message [<i>MS: Creation(1)</i>, <i>TOR: optional element not applicable</i>; <i>TOI: deactivate path (51)</i>] for the part of the old (blue) path from the first point of the rerouting until the final destination.</li> <li>4. IM creates the new path and PathID for the rerouting and the remaining part of the original route until the final destination.</li> <li>5. IM sends <i>PathDetails</i> message [<i>MS: Creation(1)</i>, <i>TOR: Modification (3)</i>; <i>TOI: booked(22)</i>] for new (green) path and PathID. The old PathID (of the blue path) will be added in the RelatedIdentifier section of the <i>PathDetails</i> message.</li> <li>6. No <i>PathConfirmed</i> message for acceptance of the new path by ResponsibleRU is necessary, because it has already accepted in step 1.</li> <li>7. Normal procedures apply for remaining train run (TrainRunning messages, etc.).</li> </ol>

## Business Case 1.6: Train is rerouted

The described procedure is intended for incident management in "hot operations" and does not replace the procedures used in planning.

As stated in the TAF/TAP TSI, the mandatory message exchange in operations is between ResponsibleRU and IM.

