Subject: [railML3] Interpreting @applicationDirection of <linearLocation>
Posted by Larissa Zhuchyi on Tue, 03 Sep 2024 17:12:33 GMT
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Dear all,

This post deals with an ambiguity we found when specifying the location of an oriented functional infrastructure element when using <linearLocation>.

<linearLocation> as well as <spotLocation> have an attribute @applicationDirection, which is used to indicate the orientation of a functional infrastructure element in regards to the orientation of the underlying netElement. As <spotLocation> can refer only to one <netElement> there is no problem in interpretation. However, <linearLocation> can have an ordered list of <associatedNetElement>s each referring to a <netElement>. The direction of definition may vary between these referenced <netElements>. Therefore, it is not clear to which <netElement> of <linearLocation> its attribute @applicationDirection is referring. Below we suggest how to interpret this to resolve ambiguity.

Please let us know:

1) If you agree with suggested approach;

2) If no room for misinterpretation is left.

Currently @applicationDirection is defined as follows "direction in which the element is applied, related to the orientation of the <netElement>".

railML.org's suggestion: within a list of <associatedNetElement>s of one <linearLocation> the attribute @applicationDirection should be linked with the <netElement> referred from the "first" <associatedNetElement>.

"First" <associatedNetElement> can be identified:

1) implicitly by linearCoordinateBegin/@measure that is not equal to linearCoordinate-/@measure of any other <associatedNetElement> within a list;

2) explicitly by the associatedNetElement with the lowest value of its attribute @sequence.

In the example below //linearCoordinateBegin/@measure="x" is not equal to any of //linearCoordinateEnd/@measure. Therefore @applicationDirection should be linked with "ne_q".

Therefore for example if applicationDirection is "normal", then <length> begins at point "x" and continues in the direction from intrinsicCoord="0" to intrinsicCoord="1" of netElement/@id="ne_q".


```
<overCrossing id="ov01">
 <linearLocation id="sps01_lloc01" applicationDirection="k">
  <associatedNetElement netElementRef="ne_q">
```

```xml
    <linearCoordinateBegin positioningSystemRef="lps01" measure="x"/>
    <linearCoordinateEnd positioningSystemRef="lps01" measure="y"/>
   </associatedNetElement>
   <associatedNetElement netElementRef="ne_f">
    <linearCoordinateBegin positioningSystemRef="lps01" measure="y"/>
    <linearCoordinateEnd positioningSystemRef="lps01" measure="p"/>
   </associatedNetElement>
   <length value="500.0" type="physical"/>
  </linearLocation>
 </overCrossing>

 <netElement id="ne_q">
  <associatedPositioningSystem id="ne_q_aps01">
   <intrinsicCoordinate id="ne_q_aps01_ic01" intrinsicCoord="0">
    <linearCoordinate positioningSystemRef="lps01" measure="j"/>
   </intrinsicCoordinate>
   <intrinsicCoordinate id="ne_q_aps01_ic02" intrinsicCoord="1">
    <linearCoordinate positioningSystemRef="lps01" measure="y"/>
   </intrinsicCoordinate>
  </associatedPositioningSystem>
 </netElement>
 <netElement id="ne_f">
  <associatedPositioningSystem id="ne_f_aps01">
   <intrinsicCoordinate id="ne_f_aps01_ic01" intrinsicCoord="0">
    <linearCoordinate positioningSystemRef="lps01" measure="y"/>
   </intrinsicCoordinate>
   <intrinsicCoordinate id="ne_f_aps01_ic02" intrinsicCoord="1">
    <linearCoordinate positioningSystemRef="lps01" measure="z"/>
   </intrinsicCoordinate>
  </associatedPositioningSystem>
 </netElement>
```

Sincerely,