Subject: Modelling of gaps and overlaps in mileage
Posted by Martin Karlsson on Mon, 27 Aug 2018 14:12:31 GMT
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RTM states that a linear positioning system represents a position along a railway line as "a single number". This single number is implemented in the model as an attribute "measure" in class LinearCoordinate.

However, the assumption of a single number is inconsistent with real life mileage values in many countries. The problem is that a kilometer on the railway is not always 1000 meters long.

Of course, when the kilometer posts were planted, say in the late 19th century, there was 1000 meters between them. But things have changed over the years. When a track is straightened, it becomes shorter. When a curve radius is expanded, the track becomes longer. In some countries, e.g. France and Belgium, this is solved by still reporting the fraction of the actual "kilometer" length as the position, rather than moving every km post from Paris to Marseille for every such change.

In other countries, e.g. Germany and Sweden, mile post equations are introduced for the same reason. Such an equation could say that km 52 ends after e.g. 972 m, or that km 53 extends to 1054 m. In railML 2 syntax, these anomalies are defined as "mileage changes" of type "missing" and "overlapping" respectively.

Obviously, this makes a single number insufficient to represent a position. If we, in my example above, have passed km post 53 by 1020 m, how can we represent that? In Sweden, and in other examples I have seen, it is shown as 53+1020. This format is of course used consistently, so a position 100 m earlier would be shown as 53+920, not as a decimal number. But there could be decimals on the meter count, e.g. 53+1020.5.

I have already asked about this problem in a previous forum post (https://www.railml.org/forum/index.php?t=msg&th=471& start=0&). This time, I would like to propose a solution.

I suggest that the "measure" attribute of LinearCoordinate is replaced by two attributes, measureBase (an integer) and measureFraction (a double). Same for all the other measures, like startMeasure and endMeasure of LinearPositioningSystem. Alternatively, there could be a LinearMeasure class to use in all these cases, containing the attributes "base" and "fraction". Probably, the attribute "units" in LinearPositioningSystem should also be replaced by baseUnits and fractionUnits, for clarity.

Although this change is suggested for the "German" use case, it would work also for the "French" case, although the fraction part would then always be less than 1.

Subject: Re: Modelling of gaps and overlaps in mileage
Posted by christian.rahmig on Mon, 24 Sep 2018 12:55:11 GMT

Dear Martin,

Am 27.08.2018 um 16:12 schrieb Martin Karlsson:
> [...]
>
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> LinearPositioningSystem should also be replaced by baseUnits
> and fractionUnits, for clarity.

This proposal sounds valid to me, and indeed, it could solve existing problems of ambiguity related to railway line coordinates. Having a "base measure" and a "fraction measure" instead of a single "measure" therefore seems to be a very straight-forward solution.

The questions about mileages and their various specialities has already been raised earlier [1] and is still waiting for a profound answer by the RTM Expert Group. In particular, it has to be clarified how class LinearAnchorPoint shall be used and which role it can play for defining mileage gaps and overlaps.

[1] https://www.railml.org/forum/index.php?t=msg&th=577& start=0&

Best regards
Christian Rahmig

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