

COLOMBO SUBURBAN RAILWAY PROJECT, PART IV; METER-GAUGE ON KV-TRACE - FEASIBLE?



Colombo Suburban Railway Project
Ministry of Transport & Civil Aviation - Sri Lanka Railways



Once upon a Time with Narrow-Gauge on KV-Line

By Dr. Frank Wingler, September 2018

COLOMBO SUBURBAN RAILWAY PROJECT; Meter-Gauge on KV-Trace – feasible?



Once upon a Time with 2 ½ ft Narrow-Gauge on KV-Line

The author is aware that his suggestion to operate a modern rail-transport system on the KV-trace in **Meter-Gauge** will not meet with much approval amongst Srilankan experts as they hope, once to extend the KV-line from Padukka via Ratnapura and Embilipitiya to Hambantota.

The extension project via Embilipitiya has no chance to become reality, because to build such a connection will become too expensive and also uneconomical. The hilly terrain between Padukka and Ratnapura and between Kahawatte and Thimbolkatiya will create immense costs and will become a major engineering challenge. But even if such a project should be once realized, why not with Meter-Gauge, which will make things cheaper and easier!

Other countries have shown that there is nothing wrong to operate a railway with two different gauges. On advanced European Railways **Meter-Gauge** and even 760 mm **Narrow-Gauge** for suburban commuter services are by far not outdated.

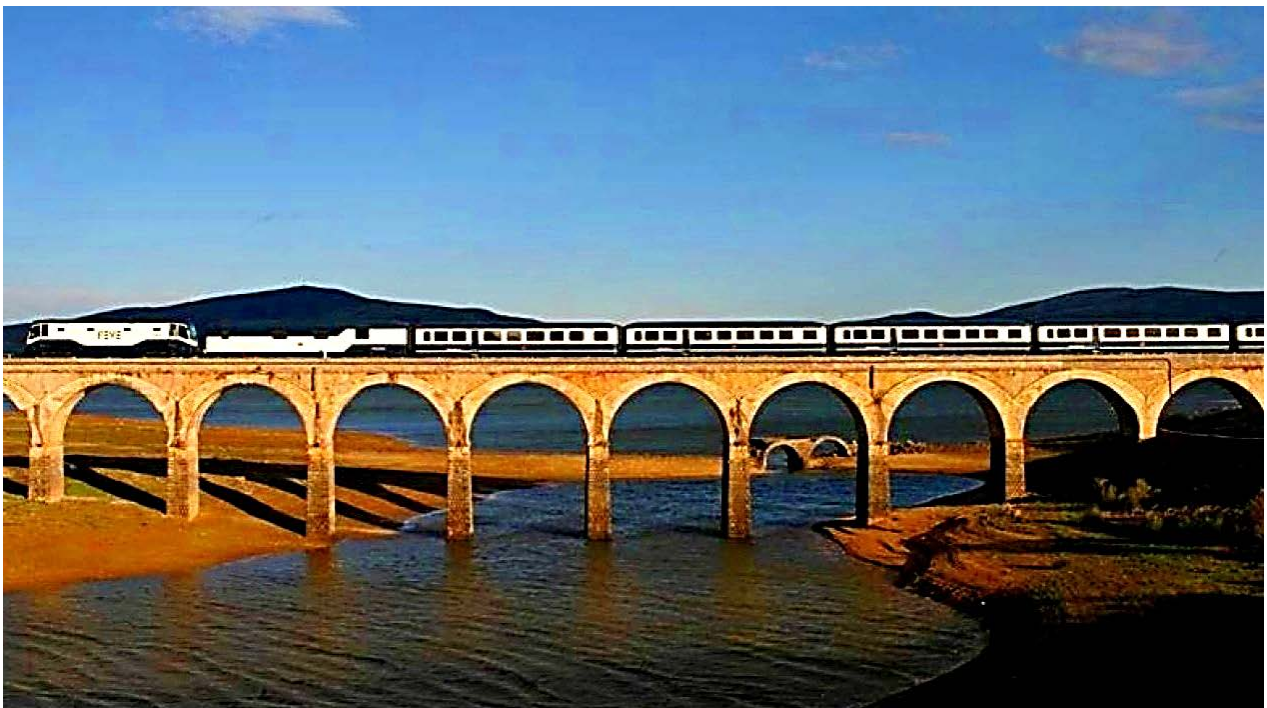
In North Spain, RENFE operates a modern 1250 km **Meter-Gauge network** for urban/suburban and even for long distance trains although the main trunk lines are in Iberian Broad Gauge.



Spanish RENFE-FEVE Meter-Gauge Network in Cantabria (green/yellow: Meter-Gauge, red: Iberian Broad Gauge)



RENFE-FEVE Diesel Light Weight Rail-Car Composition on Meter-Gauge for Suburban Commuter-Service **in North Spain**



Meter-Gauge " *TRANSCANTABRICO* " Luxury Train in North Spain

Where Meter-Gauge meets Broad-Gauge, tracks, turnouts and crossings can be laid in dual gauge as a gauntlet track. Rahee Industries, India, is specialized in providing track-technology for gauntlet tracks in Bangladesh:



Mixed Meter-Gauge/Broad-Gauge Gauntlet-Track Technology by Rahee Ind. in Bangladesh

Bangladesh operates successfully on a **mixed Indian Broad-Gauge – Meter-Gauge** rail-network.

Besides the Standard-Gauge network, Switzerland has **860 km Meter-Gauge Network** in operation, and is still investing heavily in upgrading and expanding the Meter-Gauge network by building new and re-engineering existing long alpine tunnels and by investing in new modern light-weight rolling stocks.



Zermatt – St. Moritz Glacier Express on Meter-Gauge, Switzerland



Harz Meter-Gauge Railway, Germany in 2018

In East Germany there are still several Narrow-Gauge (NG) (760 mm, 2 1/2 feet) railways for commuter-service as well for tourist-operation running. For peak hour commuter-service the Doellnitz Railway got recently from the Austrian Ziller-Valley NG Railway a new Light-Weight Diesel Rail-Car.



Modern NG Light Weight Diesel Rail-Car for Commuter Service **for NG** Doellnitz-Railway in Germany, on Test Run in Austria on the 760 mm NG Ziller-Valley Railway

Austria operates successfully several **760 mm Narrow-Gauge Railways**. The 32 km long Ziller-Valley NG railway transports per year 2.5 million passengers. The question had been to electrify the line. The decision went in favour of powering the rail-cars in future by **HYDROGENE** fuel cell technology:



Stadler designed Rail-Car for Commuter-Service on 760 mm Narrow-Gauge dual Track Ziller-Valley Railway in Austria, **powered** with Hydrogen Fuel-Cells; Animation by Stadler Bussnang

The longest **Narrow-Gauge** railway in operation in Austria is the 92 km Mariazell-Railway from St. Pölten to Mariazell near Vienna:



For suburban commuter service this NG railway got modern Light Weight Rail-Cars build by Stadler:



Modern High Capacity Suburban Commuter Service on 760 mm Narrow-Gauge with electric Light Weight Rail-Car on renovated Mariazell-Railway, Austria

Stadler Bussnang, Switzerland has recently built a modern 760 mm Narrow-Gauge Diesel-electric rail-car with middle power module traction for OSE, Greece. This 80 kmph fast vehicle had been tested in Germany on the recently renovated NG track of the Öchsle-Railway; see also F.A. Wingler: **DESIGNING A LIGHT WEIGHT MODEL RAIL-CAR FOR THE "LANKA ECONO RAIL" PROJECT**, published on: July 15, 2016 August 23, 2016 on <http://www.drwingler.com> :



Stadler build NG Light Weight Rail-Car with middle Power Modul Traction on Test Run on rehabilitated 760 mm NG Rail-Track in Germany, 2007, Pict. by A. Schatz, Ulmer Eisenbahnfreunde

The ailing SLR Broad-Gauge Main-Line from Rambukkana to Badulla cannot be gauge converted for Meter-Gauge, although **Meter-Gauge** would have many advantages and would have made things easier on the narrow trace with tight curvatures. However, on the KV-trace a gauge conversion to **Meter-Gauge** should be possible and feasible.

The CSRP program should be implemented in steps, and one should concentrate first of all

- ◆ on establishing a modern high capacity suburban commuter rail-transport system on the trace of the KV-line (in Meter-Gauge and Y steel-sleepers) with Light Weight Rail-Cars, and
- ◆ on re-engineering the Balana-Incline from Rambukkanna to Kadugannawa with Y-shaped steel-sleepers, rock-stabilization, rock-fall and slop-slide protection under formation broadening for train-speed increase.

The second step should be deploying and implementing modern and state-of-art rail-track technology on the lines and designing new high capacity track-layouts for the stations on the corridor PANADURA-VEYANGODA in order to increase route capacity, train-speed cutting journey times between the stations, and to shorten headways through modern signalling and train protection systems. Electrification can come later, after the upgrading works for tracks and station-layouts have been completed.

ELECTRIFICATION is presently not feasible because

- ◆ there is not enough reliability and redundancy of power supply,
- ◆ the capital investment needed, and compared with the energy and maintenance savings gathered through running only a part of the trains electrically, will become exorbitant high.

The problems of **Rail-Traffic in Sri Lanka** are not related to the question: **“DIESEL- OR ELECTRIC TRACTION”**. They are related to the ailing rail-tracks and inferior track quality engineering standards cum low-capacity layouts of stations with turnouts and crossings of outdated technology. The problems are also related to the poor repair, service and maintenance of rolling stocks and train-brake systems.

Upgrading and re-engineering of the ailing tracks on poor bearing narrow and badly drained formation and renovation of track-layouts at stations for higher traffic capacity through modern technologies should come first before financing electric traction.



**Once upon a Time with Steam on Narrow-Gauge in Sri Lanka;
Kelani-Valley Railway**



**Modern Diesel Commuter Rail-Car on Narrow-Gauge in Austria;
Ziller-Valley NG Railway**