

Newsletter 2014 - 3

2014-04-24

Magnetic-train Scandinavia

News

Welcome to the only inter-Nordic newsletters about magnetic-trains.

Sweden

The Swedish government agency Trafikverket declared earlier this month that they have studied the possibility to make the track in "Ostlänken" (Stockholm-Linköping) raised up over the landscape in stead of cutting through it.

This method give great environment and building speed advantages.

With raised track inspired by maglev-track, have some, but not all of the advantages. Trafikverket still is not commenting on maglev technology.

Denmark

The Danish Parliament's Transport Committee receives on 2014-04-24 this magnet train group in an audience where a new series of OH are being displayed (link) and a number of development opportunities will be presented.

[Link](#)

International

The Nordic "8 million city" group has organized the final conference. We have initiate dialogue with the group and future development areas.

Ole Rasmussen (DK) from magnetic train group attended the conference.

Transrapid Test Track

Series – Magnetic trains around the globe

In early 1980 it was obvious that Transrapid needed a full scale test track. The first part was finished in 1984. In 1985 the track was complemented with a southern

circular track section, and in 1987 a northern high speed circular track, so the train could run continuously.



Above: Transrapid TR09 on transrapid test track

The first train tested on the track was the Transrapid TR06, it topped out just over 400km/h. A lot of data was collected from TR06 and in 1989 a radical new train, the TR07 with improved aerodynamics, suspension and lifting mechanism. The mass was also lowered considerably. A new cheaper track segment was also developed, significantly decreasing cost of track construction. A handful of segments was instated for durability testing.

After 15 years of testing in 1999 the TR07 was updated in a TR08 pre-production, ready for regular service. A new concrete hybrid track section was also developed to decrease track installation cost more. This system is almost identical to the one later installed in Shanghai. In 2007 after years of experience in regular service a TR09 was developed with a high number of improvements over the TR08. With everything from increasing comfort, to reducing maintenance cost. The old thyristor was also replaced by modern transistors reducing energy consumption.

Copenhagen to Aarhus

Part 3: Denmark

Series – Scandinavian parts
Proceeds from the newsletter in March in the series on Scandinavian routes.

This is not a professional investigation, but only a few

different options over how a stretch would be able to go. Calculations are made with the same program as the official investigation.

Total distance: 180-190km

Estimated cost: £ 50-65 billion

Stations: 5

Population city: 1,7 M cents.

Total population: approx. 2.5 M metro

Direct travel documents: ~550k/month

Further connecting: ~680k/month

Km cost directly: 120-165öre/km

+ Connecting Göteborg: 95-133öre/km

+ Connection Oslo: 90-125öre/km

(estimated using the same model The model is not optimized for conditions along the route and therefore can distinguish one part against expecting real results). Model assumes direct land route from Aarhus to Kbh. If this is not available the number of travelers will be significantly higher, and as a result cost lower. There is no model available to date doing this estimation.

See map overleaf

Track can use a new south exit from Copenhagen with extensive tunnel-work, or a north exit following the same route as Göteborg to Copenhagen line, reducing cost, but also reducing capacity.

Following a somewhat straight line across Sjælland there is a possibility of stop near Roskilde and Kalundborg reducing the strain on existing commuter service.

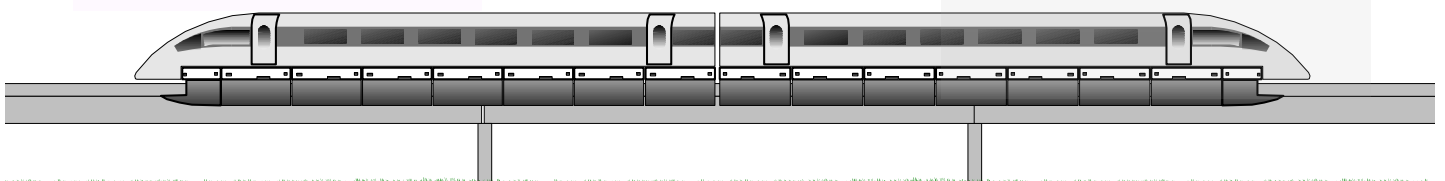
Over Kattegat to Samsø there is needed a tunnel to allow for shipping to pass with unlimited size. Using Samsø as a staging platform the tunnel can exit and using a medium size bridge allowing small and medium size ships to pass.

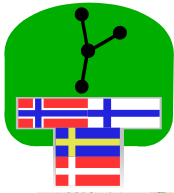
At Samsø a new city can be built with mere minutes access to both Aarhus and Copenhagen center.

Over to Aarhus a direct bridging low cost Transrapid track can be built. After reaching Aarhus a station can be built just south of the city to reduce cost and building time, or near center in a tunnel for intimate city access.

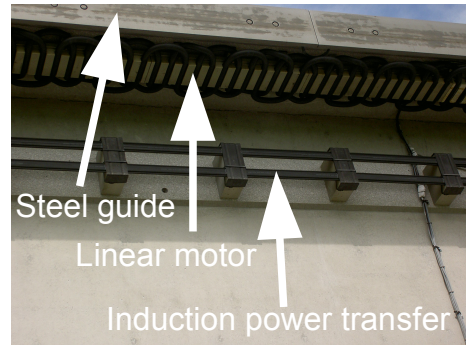
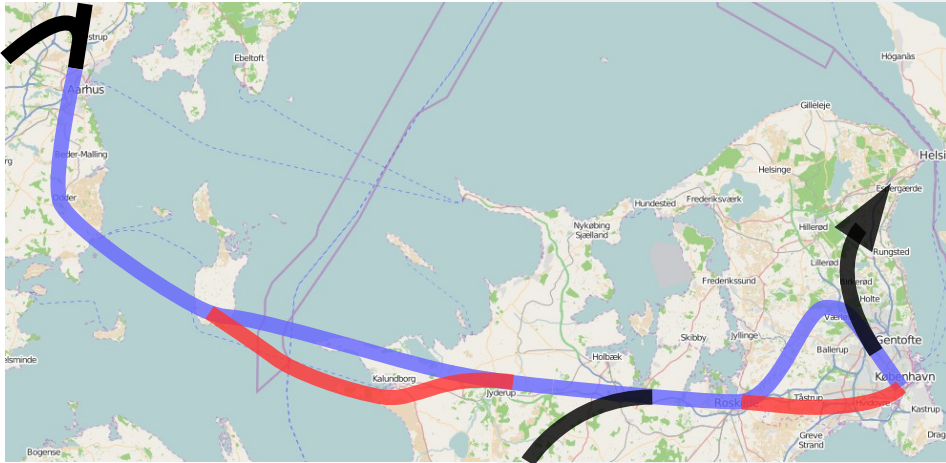
Future expansion can be built right through Aarhus to be split up in two single track lines to access both Aalborg and Esbjerg to a reasonable cost

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Göteborg (5 stops): 56 minutes
 Oslo (8 stops): 102 minutes
 Oslo (1 stop gbg): 75 minutes
 Stockholm (13 stops): 132minutes
 Stockholm (nonstop): 90 minutes



The picture shows one of the two symmetrical sides of a TR09 Transrapid track. The component viable, Steel guide, Linear motor and Induction power transfer is the only component needed on the TR09 track.

Guide-way is made almost exclusively of concrete, the only exposed steel is the steel guide, reducing both up front cost and maintenance
 Linear motor made of rubber and aluminum and completely shielded from the sun by the track.
 All transformers and power-supply equipment is situated in secure areas every 50km with only small relays situated every 4 km next to the track.

Transrapid TR09 is arguably the most modern magnetic-levitation transport-system available on the market today, replacing relay station with electronic inverters could both increase efficiency and reduce maintenance.

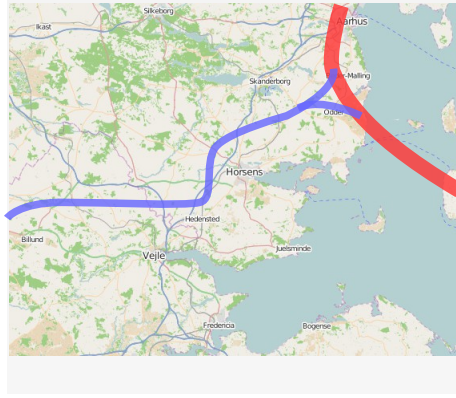
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Samsø in year 2040? This could be true for the Samsø, but Aarhus C only 7 minutes away and Kbh 25 minutes, it becomes very attractive to live on the island.

Traveling time from Copenhagen:
 Roskilde: 7 minutes
 Kalundborg (1 stop): 17 minutes
 Samsø (2 stops): 25 minutes
 Aarhus (non stop): 25 minutes
 Aarhus (3 stops): 38 minutes
 Randers (1 stop): 33 minutes
 Aalborg (2 stops): 47 minutes
 Hedensted NV (1 stop): 35 min.
 Billund (2 stops): 45 minutes
 Esbjerg (3 stops): 57 minutes
 Landvetter (4 stops): 50 minutes

Over: Copenhagen to Aarhus via Samsø
 Under: Aarhus to Hedensted and Billund Airport continuing to Esbjerg



Technology Explained

How does Transrapid TR09 works
 Transrapid trains are similar to Linimo trains in having lifting magnets under both sides of the T-shaped track. But while Linimo uses a passive magnetic field Transrapid is lifting in a moving electromagnetic field. That is Transrapid uses the same magnetic field for both propulsion and lifting.
 The induction power transferee is a system unique to TR09 reducing maintenance cost for both vehicle and track to a fraction of other systems. Transferring power to the train cordless, similar to a electric toothbrush.

Modular system

A great advantage with Transrapid transport system its that its totally modular, making it possible to upgrade part by part.



A TR09 train on old TR08 track

<https://www.facebook.com/MagnettagGotaland>
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