Newsletter 2014 - 1

2014-01-17

Magnetic-train Scandinavia

News

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

Sweden

In early 2014, the government has decided that the Transport Administration must act quickly to new main lines in Sweden. The issue of new ordinary courses have been updated in the fall when a series of train accidents caused by inadequate maintenance occurred during the short period.
Magnetic-train in Götaland has previously studied the issue from the perspective magnetic-trains.
Link

Denmark

Danish minister to visit China and Japan. Two countries that have both magnetic-trains and magnet courses. The delegation is expected to be in Japan and China from 18 to 25 January.
Link

International

Japan has granted loans to the U.S. about to begin a path between Washington DC and Baltimore. The track is scheduled to be later extended to Boston.
Kilometer cost for the intended runway is expected to be relatively high, more than 800 million per km. This is due to a combination of the very expensive plant conditions and use of the Japanese SC-maglev.
More information

Linimo

Series – Magnetic trains around the globe

When maglev mentioned talked often about Shanghai Maglev Transportation as if they were the only commercial banana. Actually there are quite a number magnetic-tracks around the world. Linimo is one of the magnet courses that carry most passengers per day. The track is used as a commuter train system in Nagoya, Japan.
Total cost of the system was the equivalent of 2 billion Swedish kronor, equivalent to just under 250mkr/km.
Linimo is one of the courses with the lowest km cost in operation today. There were several costly causes of the track, including the track was built as a prototype and has walkways on both sides of the track along the entire route.

Bildkälla: Wikimedia Commons

Är Linimo en framgång? Ur en ekonomisk synvinkel är Linimo ingen framgång. Biljettintäkterna täcker driftkostnaderna, men inte räntekostnaderna. För Nagoyas kollektivtrafik är den positiva påverkan märkbar med närmast ljudlös och väldigt snabb transport mellan centrala staden och stadens ytterkant.
Tekniskt sett har banan idag fått två efterföljare. En i Peking och en i Incheon (South-Korea).
Vad som är tråkigt är att egenskaper som driftsäkerhet, låga driftkostnader, akustik ofta underskattas relativt till prestanda, vilket tyvärr innebär att system så som Linimo sällan uppmärksammas.

Oslo to Copenhagen

Part 1: To Gothenburg

Series - Scandinavian sections

This is not a professional investigation, but only a few different options of how a stretch could go. All calculations are made with the same program as magnetic-trains Scandinavians official report uses.
Total distance: 270-285km
Estimated cost: 51-59mrd Kr
Stations: Up to 6
Population Surface: 1.6M centrally
Total population: about 2.6M metro
Direct travel documents: 470k/månad
Further connecting: 1400k/month
Km cost directly: 105-117öre/km
+ Connection Copenhagen: 59-63öre
+ Connection Stockholm: 61-67öre
+ connecting both: 49-52öre/km
(Estimated using the same model. The model is not optimized for the conditions on the route, and therefore may in part where the expected real earnings)

See map overleaf. Departure from Oslo, there are basically two roads south out of town. The cheaper alternative is to follow the existing rail line straight east and finally a short tunnel. A more expensive but shorter route is a tunnel directly south east of Oslo.

About 50 km south of Oslo, it is appropriate to prepare the latter further connected to Stockholm. This may also be a suitable location for a Northern depot.

Further south in Fredrikstad and Halden, a suitable intermediate stops to be. When the cities are relatively close together and are not particularly large, it is only economical to stop the trains in either cities. This can be solved by connecting train, or a system where every other tour stops in each of the cities.

On the Swedish side of the border, there is a similar problem between Uddevalla and Trollhättan. But when the cities are fully in angle with the route, it is not possible to let every other trains stop at each station.

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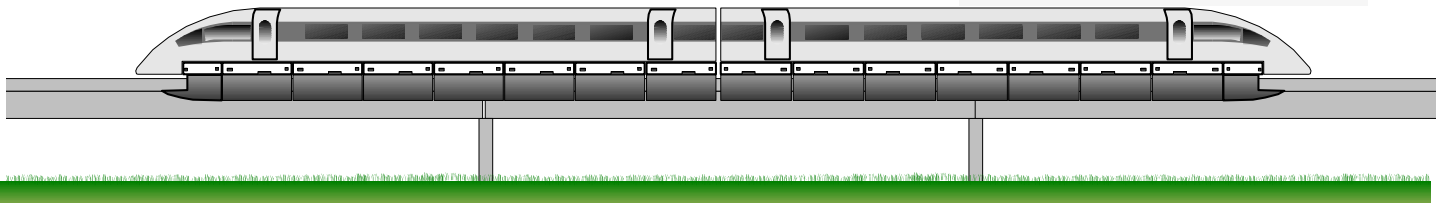

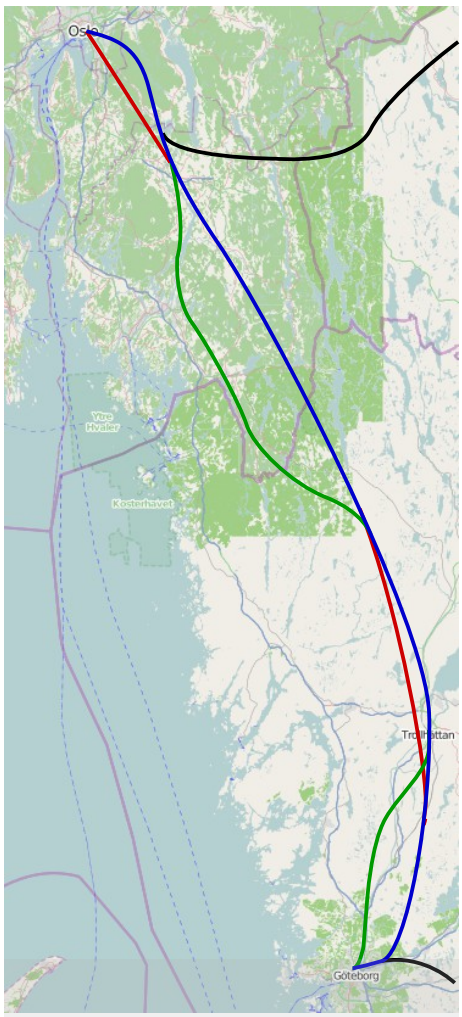

Continuation page. 1. Oslo to Gothenburg

Toward Gothenburg there are two principal possibilities to enter the train station.

The most obvious solution is to follow the “Göta Älv” or E6 straight into the train station. This provides a shorter and straighter road to higher cost per kilometer as a result.

Another option is to pull out the track inland of Gothenburg. This solution is in the short term more expensive, but has the advantage that if the track is built on towards Copenhagen and / or Stockholm , no further path expanded from Gothenburg.

With the connection to Stockholm and Copenhagen , a solution of this type can be advantageous as it allows you have to change out of town and thus drastically reduces traffic in Gothenburg city center. Make even more local and regional trains can use the web as more capacity is released .

Overall , this route is considered to have good base and relatively low construction costs , then the intermediate terrain is favorable for magnetic tracks. However, a market economic viability questionable without further connection. With connection to either Stockholm or Copenhagen conditions change significantly. Interestingly contribute either connecting more to the increased passenger densities on the track than all locations along the route together . With a hub at Landvetter airport , giving Oslo and Copenhagen residents access to another airport .

Technology Explained

How does Linimo work

Linimo uses the very simplest type of magnetic-train principle.

The train is driven by a 3-phase alternating magnetic field in the track runs a plate in the bottom of the train forward, this is the only active part of the track, while the corresponding part of the train completely passive. This method is very cheap, but have higher losses than other options.

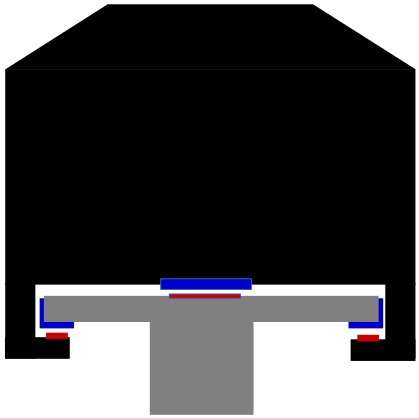

Photo: Blue - Metal, Red - Magnetic Grey - Court, Black - Train

Lifting and controlling functions in the opposite way. The outer and lower edge of the path is lined with steel. It sits electromagnet at corresponding locations on the train that lift and control it. The train is powered by a skid from the runway. The method is very simple and relatively inexpensive.

One problem is that a current magnetic field is generated in the web. This field creates eddy currents.

Vortex in itself creates a resistance to the train moves forward. Which at low speeds creates relatively small losses, but increases as speed increases. The plate is divided into sections to minimize losses, but despite limited top speed of just over 100km / h

This magnetic-train-system is one of the most used. And used except in Linimo even in Brimingham maglev, M Bahan (Berlin), S1 (Beijing) and Rotem (Incheon). Linimo was the first who used the system to a full-scale commuter line.

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