Transportudvalget 2014-15
TRU Alm.del Bilag 30
Offentligt

Newsletter 2014 - 5

2014-10-29

Magnetic-train Scandinavia

News

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

Sweden

After the Swedish election planing for "Ostlänken" is pushed forward and planed starting date is around 2017. At the same time the road-told for central Göteborg was voted down in the election. This will jeopardize "Västlänken" that suppose to be partly financed by the road-told. New solutions are now explored.

Denmark

The problems with IC4 trains is now disused at the highest government level in Denmark. If no solution can be found there is a real risk that all IC4 trains have to be scraped for a huge monetary loss. Link

Norway

The earlier strategy of running the "8 million city"-trains at the at 330km/h is now under question because of high running costs. A proposed solution to the problem is lowering the top speed to 250km/h, but then maglev technology is a better option Link

International

After years of planing Japan Rail have applied for final construction start approval. Link

Japan rail invite citizens of Japan to try out the new L0 maglev train for them self before the test track is closed down for redeployment as part of the new maglev shinkansen. Link

USA: Orlando maglev is going a head as planed. Link

Yamanashi Maglev Test Line

Series – Magnetic trains around the globe

Magnetic levitation trains were first exterminated I Japan during the early 1970's. A 7 km long test-track to evaluate different systems was constructed in 1977. The configuration has changed several times during the lifespan of the test-track.

When the Japanese railway system was privatized in 1989 the test-track was handed over to JR-Central. It was quickly released that a new test-track for full scale maglev system was needed, so a new track was started in 1990.

In 1997 the Yamanashi Maglev Test Line was finished just over 18km of double track mostly within tunnels

Picture: Yamanashi test track with a MLX01 experimental train

Combined with the MLX01 experimental train, the system broke several land speed records.

In 1999 the track open for commercial tourist traffic.

The line was used in a combined test and tourist function until 2011 when it was closed down for expansion. In 2014 it reopened for test use only with the new commercial L0 train pre-production prototype and the total line length was almost 43 km, all double track.

In 2015 the test-track is planed to be permanently closed as a test-track and reopened first 2026 as part of the new Chūō Shinkansen connecting Tokyo and Nagoya as a high capacity commercial line.

Västlänken replacement

Part 5: Local maglev systems

Why don´t Göteborg have a subway system? Because they have nothing to hide!

But there might be one needed in the future. The city is growing and put a high strain on both the tram-system and commuter trains. A solution is proposed to go with computer train right throw the city in heavy rail tunnels. But the cost effectiveness of the solution have been put into question.

Have you ever travelled by subway train, in any city, and wondered why its so dirty on the tracks? All trains are electric, so where do all the dust come from. Well its mechanical dust, breaking dust, dust from power-pickup, wheel dust. This exist on trams and trains over ground to, but there it get washed away by rain to some extent.

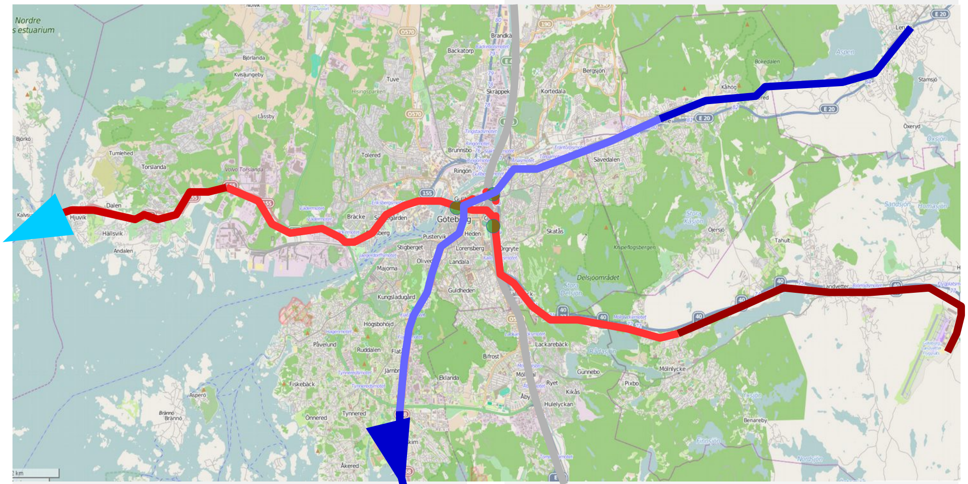
So is there any way of getting rid of dust, noise and expensive tunnels yet build a good commuter network. Yes there is, local maglev trains.

Maglev trains come in many shapes and forms, and the intermediate speed, around 100-120km/h are the most common.

Picture: Off the shelf Hyundai Rotem maglev train.

Cost effective, quite, dust-free and quick urban transport.

An over ground urban maglev system is fast and easy to build and don't create any barrier effect. It can travel roads and bike paths with no disturbance and is almost completely silent.



So what does it cost, and what do we get. Rotem maglevs construction in Incheon cost up to 2014 about 2.2 bilion sek that breaks down to about 150mkr/km and AMT maglev in Orlando is planed at a cost of 140mkr/km. The cost of Linimo was significantly more due to that development cost was included in construction, the construction only cost is unknown.
Rotem maglev is already exported to Russia. There is also a Chinese system on the market.
Looking at Göteborg we propose two initial lines of two phases of construction

Red line phase 1:
Torslanda to Mönlycke via central
~3 billion kr
17 minutes end to end 8 stops

Blue line phase 1: 17km
Tynared to Partile via central
~2,5 billion kr
15 minutes end to end 7 stops

Red line phase 2: 9km+13km
Extend to Hjulvik and Landvetter
~1,5 + 1,7 billion kr
Additional 8+9 minutes, 3+2 stops

Blue line phase 2: 9+21km
Extend to Kungsbacka and Lerum
~1,4 + 3,1 billion kr
Additional 7+17 minutes, 2+5 stops

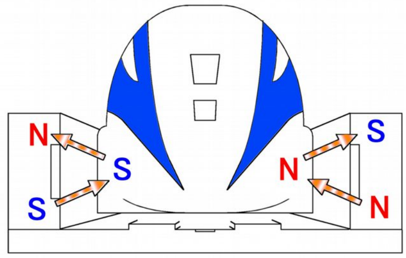
The line can be designed to cover all future sites for regional and intercity trains. Covering Göteborg Central, Gårda and/or Oslokroken may get future intercity travelers almost instant where ever a new station is placed. A Hjulvik extension may get people living on Öckerö instant platform-to-platform city center access via fast boat. Landveter extent ion may get Platform-to-terminal instant access at the airport.
Total cost, about 13 billion Swedish kronor.

Technology Explained

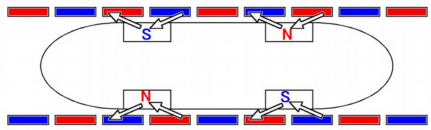
How does the SC-maglev work

How does the SC-maglev work
SC-maglev, the system used in the future Tokyo to Nagoya and Osaka maglev Shinkansen line, is one of the most complicated magnetic levitation transport systems. Similar to Transrapid, SC-maglev uses a weak but fast switching magnetic field in the track to propel the train and a strong semi-static magnetic field on-board of the train. The system propels, lift and breaks the train, but in contrast it also guides the train. The advantages to this is that the train it self only have to carry static magnets. This reduce the amount of energy consumed on-board, eliminating the need for power pick-up using only on-board batteries.
To increase the force-field of the magnets and also improve aerodynamics SC-maglev uses in car-body superconducting magnetic coils.

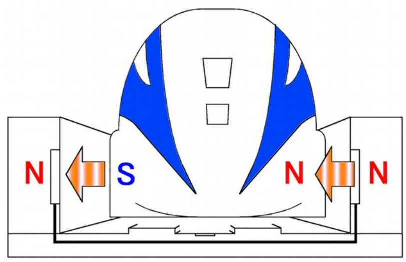
This is very effective, but relatively expensive and produce a high in-carbine magnetic fields that might be troublesome for people with pacemakers.



Picture: SC-maglev levitating system
The train levitates because of a relative field-force difference in altitude, this system is physically stable and need no control, but its statistically no stable and only work in speed, there for needing lading wheels that retract at speeds over 150km/h



Picture: Top view of proportion system
The train is propelled with the same magnets that lifts it, but the polarity is reversed every half meter or so. In this way the train is pulled both upwards and forward.



Picture: Guiding system
The guiding system worked similar to that of Transrapid or Linimo, but its placed in track in steed of on board the train. The track uses separated locally controlled magnets, while it in the train act on the same magnets as previously, Using a lot of in track control allows for a sleek and fast train, but also makes the track a lot more expensive.

https://www.facebook.com/MagnettagGotaland
http://ing.dk/debat/magnettog-i-norden-159595
Contact Danmark and Norway: Ole Rasmussen
Contact Sverige: Mattias Svederberg