



Concept Symposium 2018

Governing Megaprojects – Why, What and How

Hyperloop – How could it Impact the Society

A Hyperloop One system is comprised of a vehicle carrying passengers or freight travelling through a controlled, low pressure environment within a tube. Since low pressure environment minimizes the aerodynamic drag, the energy consumption is minimized even at high speeds.

It would reduce the travelling time from Helsinki to Stockholm below 30 minutes. Such a system would have a huge impact on society. The meaning of place and time could change completely and a Nordic super region could evolve.

The City of Salo has discussed with companies Virgin Hyperloop One and FS Links the construction of POF test track and the establishment of the Hyperloop technology innovation centre in Salo. The discussions have particularly highlighted the fact that the know-how and the labour force available in Salo can be utilized for the advantage in technology development and construction.

When implemented, the test track and the innovation centre would bring to Salo new jobs, both directly and indirectly. It is estimated that the indirect jobs will be generated by those companies, which will produce services and products for the needs of Hyperloop One and for the test track construction in Salo, and later on, when building the tracks around the world.



Mika Vilhelm Mannervesi

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The Concept Symposia on Project Governance

The Norwegian Ministry of Finance and the Concept Research Program hosts every second year a symposium on project Governance. Project governance, in brief, is concerned about investments and their outcome and long-term effects. In view of the problem at hand, the aim is to ensure that the best conceptual solution is chosen, that resources are used efficiently and anticipated effects realized. Resource persons from ministries, governmental agencies, academia, international organizations, and industry are invited. In order to facilitate professional exchange and direct communication between participants, the number of individuals is restricted. The aim is to initiate further international cooperation and research on important issues related to project governance.

<https://www.ntnu.edu/concept/concept-symposium>

Hyperloop test track @Salo

Mika Mannervesi





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City of Salo

- 52 000 inhabitants but bigger than it seems because of rich history as the leading global hub of wireless technologies
"the birthplace of mobile phone"
- Main businesses:
 - Industry: IoT, metal, engineering, woodworking, plastics, LED lighting
 - **Wireless communication devices since 1928**
 - Finland's biggest agricultural center
 - Retail trade and services



- Over 2 million Finns live within 1,5 hour radius
- All major airports, seaports and road transport hubs are at easy reach

MADE IN SAUDI



Grand history in wireless communication business: high quality expertise in development and manufacturing

Bright future in developing internet of everything



PASSENGER | CARGO VEHICLE

LOW-PRESSURE TUBE

ELECTRO-MAGNETIC
PROPULSION

PASSIVE MAGNETIC
LEVITATION

AUTONOMOUS CONTROL
PLATFORM



hyperloop | one

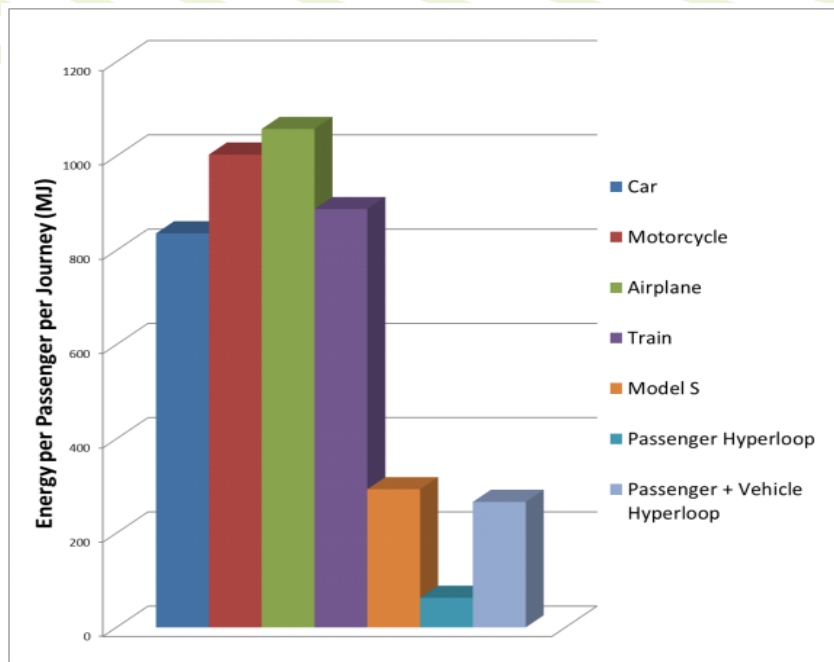
PLANNING THE HYPERLOOP FUTURE

Coordinating the EU's transport, economic and strategic policies to gain maximum competitive edge from the Hyperloop revolution.



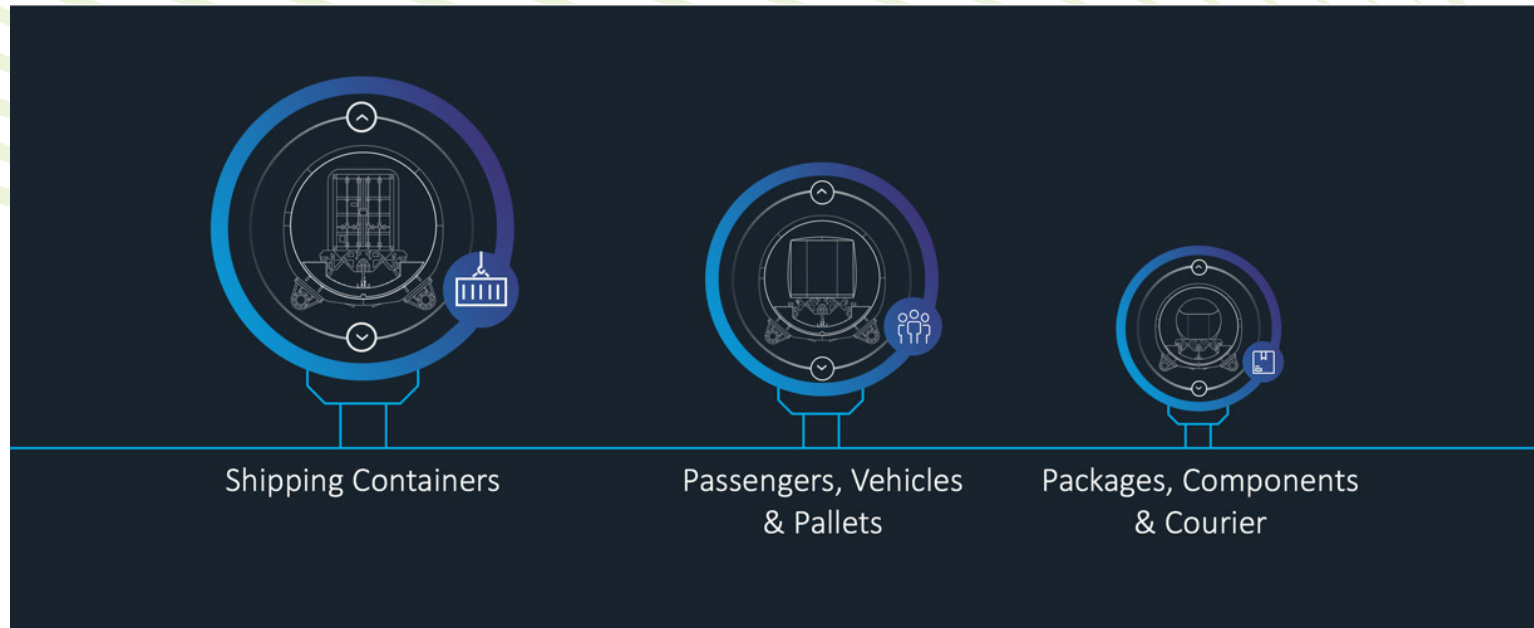
Benefits of Hyperloop

Energy efficiency and climate impacts



As a low-emission and energy efficient transport system, Hyperloop would contribute greatly to achieving the European Union climate and transport strategy goals, including the reduction of greenhouse gas emissions from the transport sector [6], innovation in clean, safe and silent modes of transport [7], increasing energy-efficiency of the transport system, and speeding up the deployment of low-emission alternative energy for transport [8]. A major advantage of the Hyperloop tube concept is extremely efficient transportation on a large scale.

Benefits of Hyperloop Multimodal logistic



Hyperloop carries both freight and passengers in accordance with the needs of a particular region. A Hyperloop system can integrate seamlessly with other forms of transportation, resulting in even greater network effects and shifts away from carbon-intensive modes. These features support the European Union targets of developing multimodal and combined logistics system [9].

Feasibility study



Environmental impacts

- Impacts on landscape, ground water, geology, nature, living areas along the corridor should be anticipated. Similar impacts have been successfully mitigated in analogous projects such as gas pipelines, highways, and railways.

Technical impacts

- Potential Hyperloop corridors, stations, 3 mainline corridor impacts and 2 branch lines have been identified for placement and the geometrical requirements have been confirmed. No impracticable limitations have been found at this stage.
- Permitting requirements and cost estimate elements identified/better clarified.

Regional impacts:

- Hyperloop would increase economic development, have a positive impact on accessibility and contribute new energy to the livability of the Helsinki, Turku and Salo city regions, and also on a larger international level.
- The Salo region and city have actively initiated and led the pursuit to realize Hyperloop in Finland, including a strong willingness to host the development center and the test track. Salo has especially good capabilities and facilities needed for the development center and the test track.
- Connecting Helsinki Airport along the proposed Hyperloop corridor would increase the airport's strategic value.

Target for Salo test track



- A testing environment that develops a new Hyperloop mode of transport.
 - Develop legislation and standards for a secure transport team
 - Verify that developed infrastructure systems, subsystems, and vehicles meet the required legal requirements and standards
 - Establish a competitive neutral, "open to all actors" facility for this verification in the EU and preferably in the Nordic region.
 - Distribute ecosystems of actors
 - Identify routes and transport modes (goods / passenger transport) with good social and commercial benefits
- Development and testing would increase the competitiveness and export of Finnish / Nordic know-how internationally among others. new technologies, industry, regulation, standardization and testing. In addition to these, it will accelerate the development of other business sectors, where the Nordic countries are strong.

Technology Readiness Level



TLR 1 Basic principles observed & reported

TLR 2 Technology concept and application formulated

TLR 3 Experimental critical function or proof of concept verified

TLR 4 Components verified in laboratory environment

TLR 5 Components verified in relevant environment

TLR 6 System/subsystem or prototyp demonstrated in relevant environment

TLR 7 System prototype demonstrated in operational environment

TLR 8 Actual system completed and qualified through test and demonstration

TLR 9 Actual system proven through successfull mission operation

Some
Hyperloop
companies
are here



Technology Readiness Level



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TLR 2 Technology concept and application formulated

Manufacturers ' own Closed facilities:

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The purpose of European open facility @Salo:

TLR 7 System prototype demonstrated in operational environment

TLR 8 Actual system completed and qualified through test and demonstration

TLR 9 Actual system proven through successfull mission operation



"Call for Finland to show the way

The interest shown in the Hyperloop presentation by the members of the Committee for Growth and Development in the Nordic Region manifested itself in a decision to write a letter to the Finnish Minister of Transport, Anne Berner. The letter called on the minister and her government to support the test track in Salo and look at the general potential for Hyperloop technology in the Nordic Region. The Committee requested that the minister speak with and inspire her Nordic colleagues to take an interest in new technology and keep the Committee abreast of progress on the Hyperloop in the Nordic Region and the test track in Salo.

The Committee has reiterated and underlined the importance of its previous request to the Nordic Ministers for Co-operation to resurrect the Nordic Council of Ministers for Transport, which was disbanded a few years ago.

"Hyperloop is one of several innovative transport solutions that highlight the need to resurrect the Nordic Council of Ministers for Transport, something Ingvar Havnen also proposed in the recent Mobility Report. We need to coordinate the Nordic transport infrastructure of the future. This would also be in line with the prime ministers' goal of an innovative and integrated Nordic Region," says the chair of the Committee, Pyry Niemi."

Next steps



To get Nordic collaboration working that would:

- Actively follow and support the work
- Participate in law, rule, norm development in the Nordic countries
- inform the relevant national and EU parliaments



THANK YOU!