S2R-OC-IPX-01-2020: Innovation in guided transport

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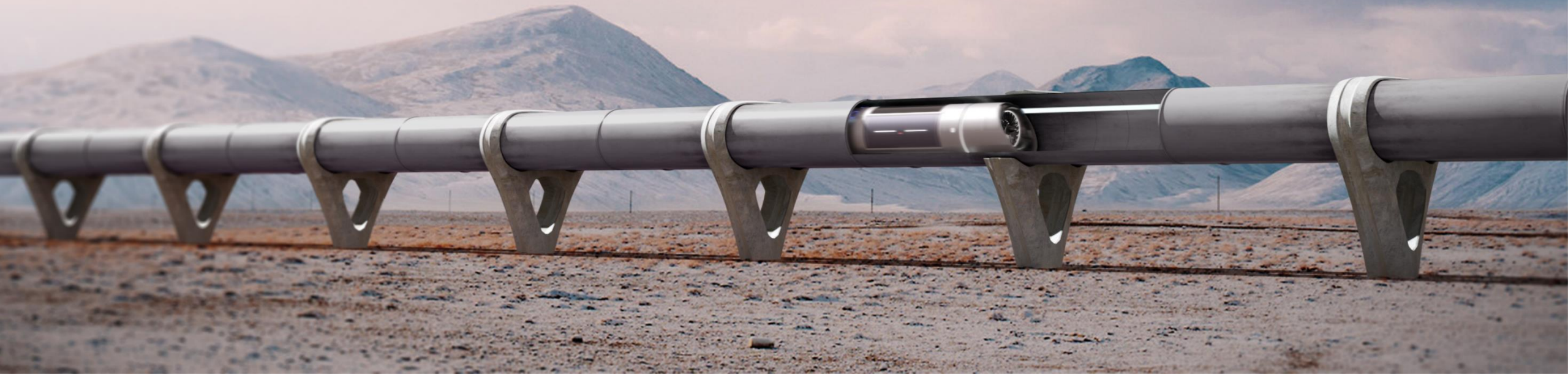
ZELEROS

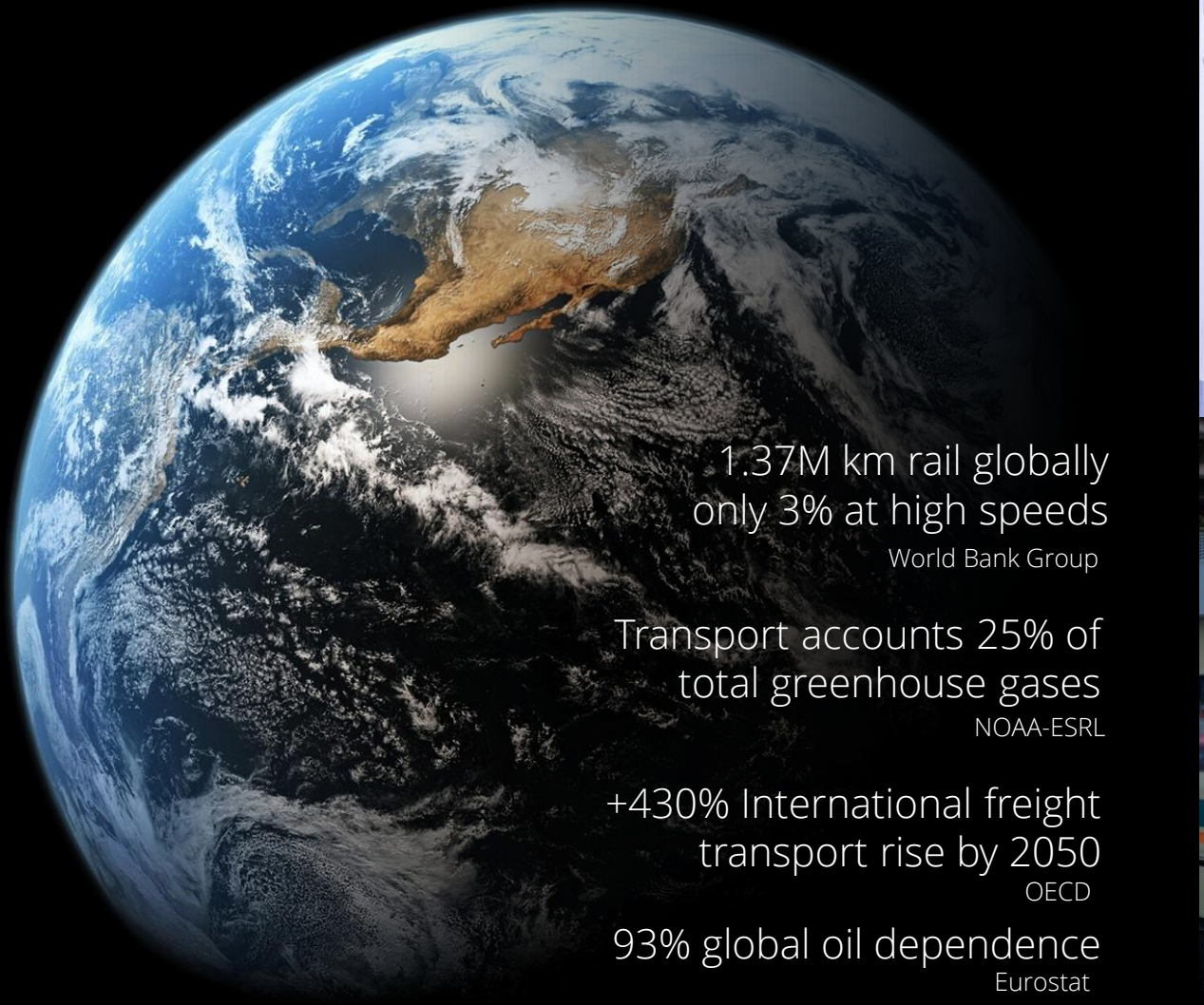
HYPERLOOP

Expanding the limits of high speed rail.

- Up to 1200 km/h.
- Sustainable, energy-efficient.
- Resistant to adverse weather conditions.



WHY NOW?



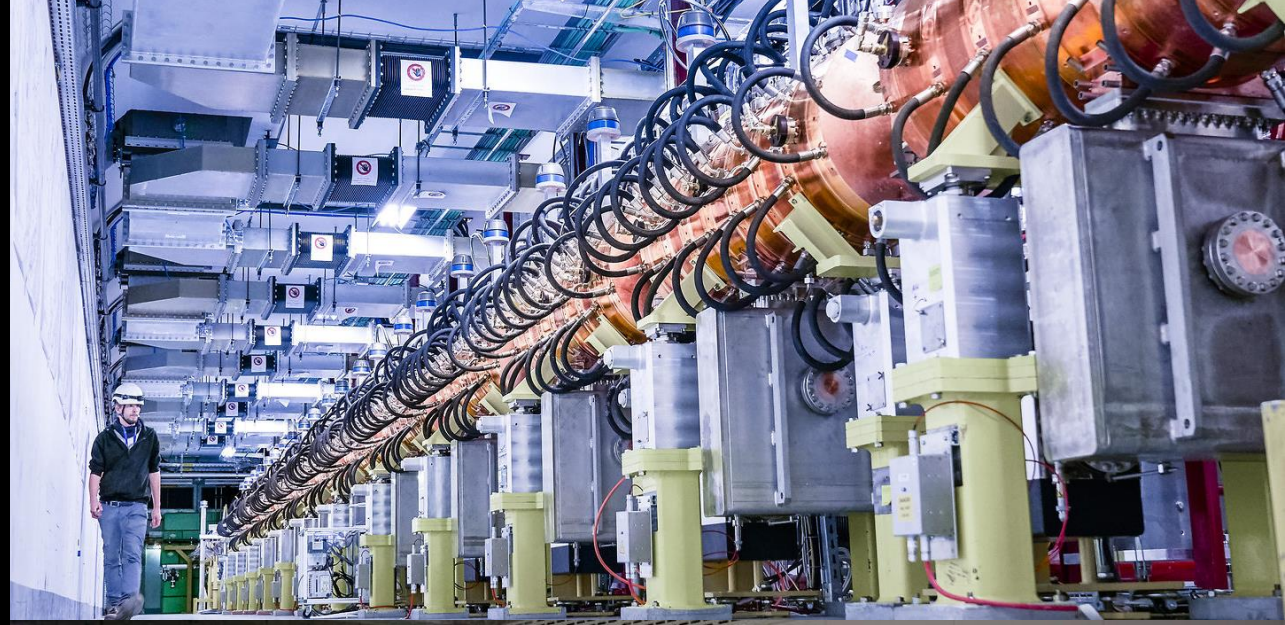
1.37M km rail globally
only 3% at high speeds
World Bank Group

Transport accounts 25% of
total greenhouse gases
NOAA-ESRL

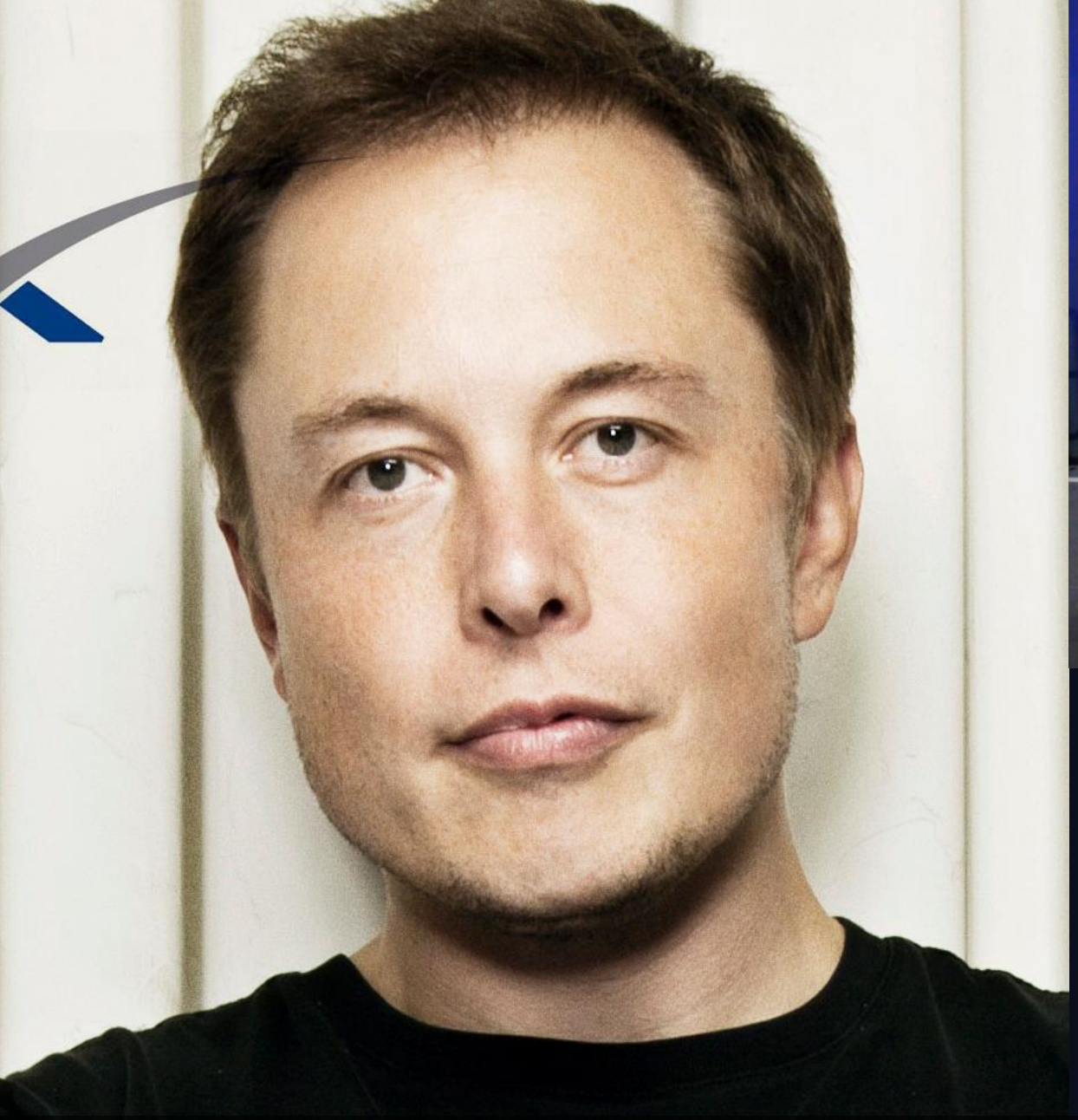
+430% International freight
transport rise by 2050
OECD

93% global oil dependence
Eurostat

1. Strong need



2. Technology readiness



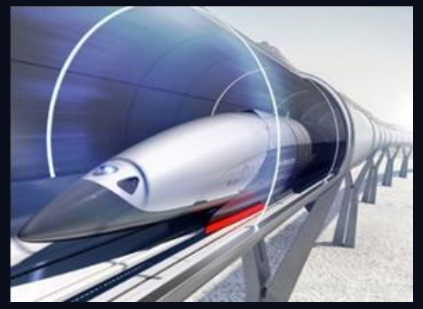
3. Popularity

2013. Elon Musk's 1st concept. **2015.** 20 student teams. **2019.** +1000 people, including companies & universities.

HYPERLOOP PROMOTERS. ECOSYSTEM.

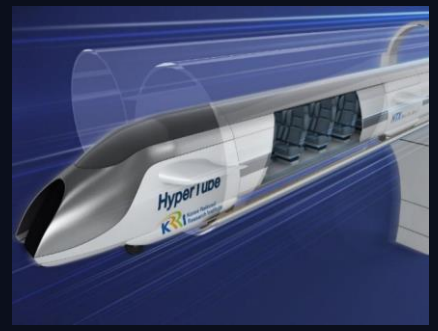
Same concept, different approaches.

Hyperloop Ecosystem

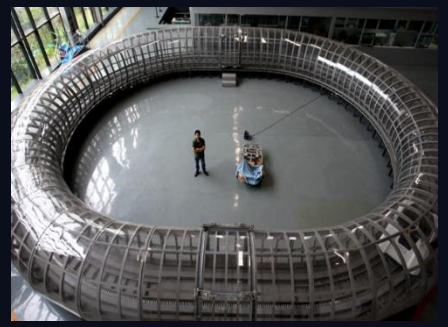


HYPERLOOP TRANSPORTATION TECHNOLOGIES

Virgin hyperloop one



Korea



China

TRANSPOD

ZELEROS

HARDT

HYPER POLAND

Cooperation Agreement for Standardisation

OUR MISSION

To develop a **faster** , **scalable** and more **energy-efficient** transportation system in Europe to expand the limits of high-speed rail.

CURRENT PROJECT STATUS

+120 people involved

ZELEROS

ALTRAN

OTHER PRIVATE FIRMS

RESEARCH CENTERS

ADVISORY BOARD

STANDARDISATION/ INDUSTRY GROUPS

Zeleros team coming from companies such as..

BOMBARDIER
Rolls-Royce
ALSTOM
ai2
ITP Aero
First Data
STADLER
Cranfield University
AIRBUS
Red Bull RACING FORMULA ONE TEAM
comet INGENIERIA
CMT motores térmicos
UNIVERSITAT POLITÈCNICA DE VALÈNCIA
futurefibres

Institutional support:

GENERALITAT VALENCIANA
eit Climate-KIC
GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA, INNOVACIÓN Y AGENDA DIGITAL
renfe

Private investors:

ANGELS
PLUGANDPLAY
ALTRAN

Research institutes:

Ciemat
UNIVERSITAT POLITÈCNICA DE VALÈNCIA
IK4 Research Alliance
ITE INSTITUTO TECNOLÓGICO DE LA ENERGÍA
institute IMdea

Industry clusters:

RIH
eurif
PTFE
PTEC
PLATAFORMA TECNOLÓGICA AEROESPACIAL ESPAÑOLA
MAFEX

AKKA
avesa
ABENGOA
ferrovial agroman
sacyr
lineco
ACTIVA
Schneider Electric
UC
tecnalia
INNOSET
ArcelorMittal
BOMBARDIER
CAF
SENER
Talgo
THALES
Indra
Ingeteam
inse rail

SCALABILITY: THE KEY FOR GLOBAL IMPLEMENTATION

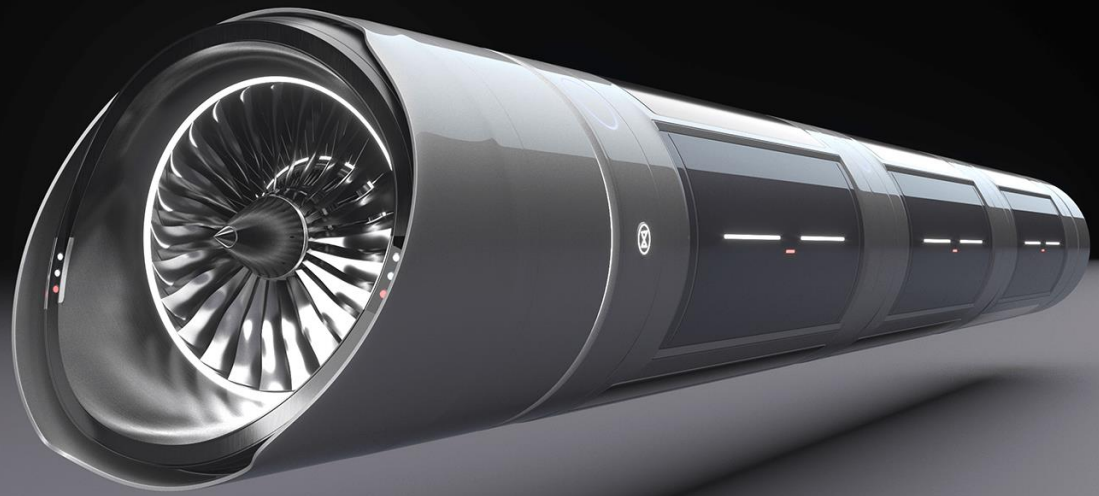
*Minimization of **infrastructure complexity with in-vehicle technologies,***
achieving a scalable solution to connect long distances at speeds up to 1200 km/h

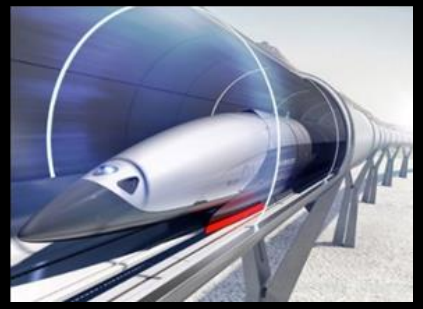
Safe
pressure levels

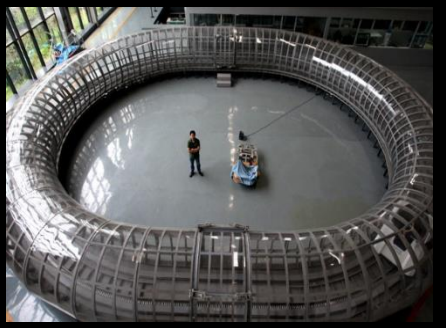
Reduced infrastructure
construction costs

Reduced infrastructure
energy needs

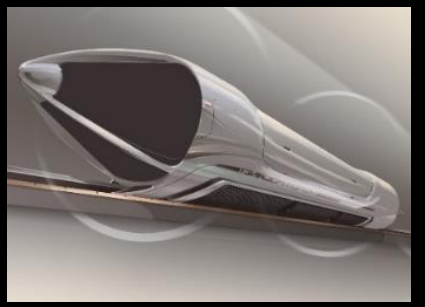
Simplified
maintenance







CONVERGENCE
Is it possible?



EUROPEAN HYPERLOOP PROJECT

Zeleros is cooperating since 2018 with other promoters and European Commission for the development of a standardization & regulatory framework.

The objective:

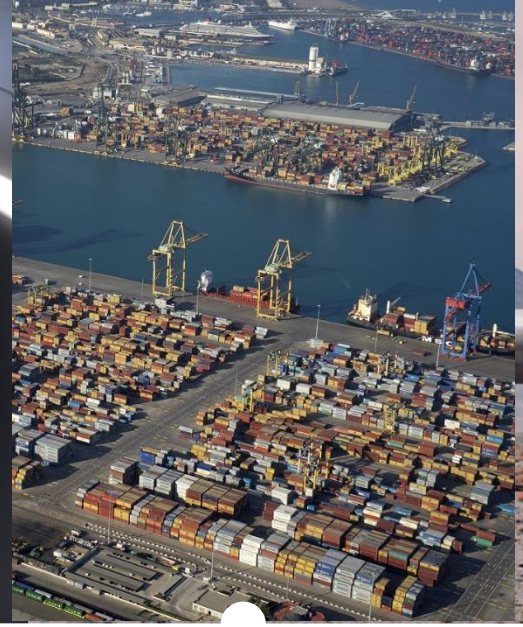
- Regulations & Standards for interoperability
- Coordination of development efforts
- Tests Facilities and R&D Centers
- Foster development of breakthroughs concepts
- Funding support for companies

Benefits for Europe:

- To share costs and risks
- To improve European market positioning
- To foster collaboration among European companies
- To empower European technologies and connectivity

Current countries involved:

ROADMAP SUMMARY



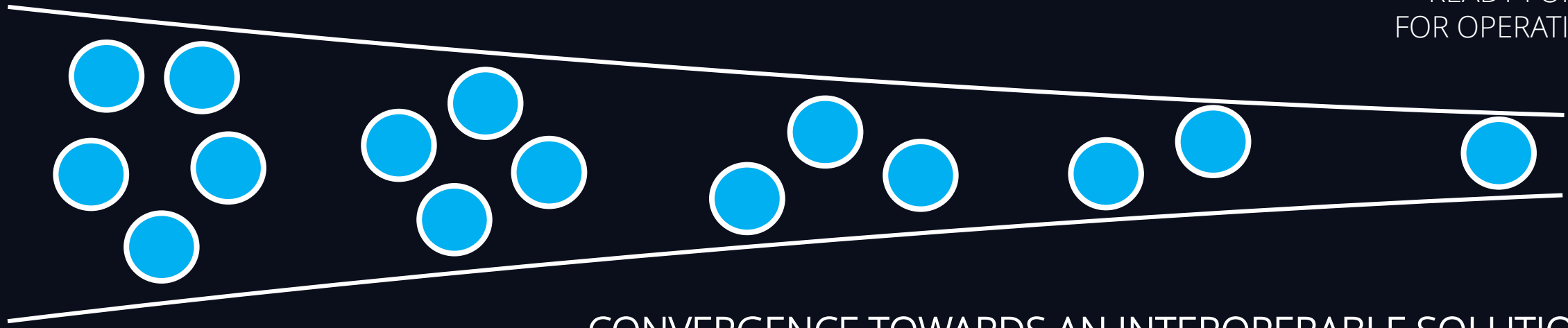
2019-2020
SUBSYSTEM TESTING

2020-2021
SYSTEM TESTING MEDIUM SCALE

2021-2023
SYSTEM TESTING REAL SCALE

2023-2024
PREPARATION FOR REAL OPERATION

2025
EUROPEAN HYPERLOOP READY FOR FOR OPERATION



CONVERGENCE TOWARDS AN INTEROPERABLE SOLUTION

STANDARDISATION & REGULATORY FRAMEWORK: PROGRESS.

June 2018

International agreement in Brussels for standardization of hyperloop.
Meeting with DG MOVE.

Sept 2018

First hyperloop conference with companies showcasing intent to cooperate on standardization.

Dec 2018

1st meeting of DG Move with Member States regarding hyperloop. Successful.

March 2019

DG Move, RTD, Growth + Shif2Rail + Hyperloop promoters

April 2019

Meeting of rail operators with HL companies, promoted by DB.

May 2019

Meeting with EASA and ERA.
Focus: Safety/Interoperability

June-July 2019

2nd follow-up meeting with Member States.

Oct 2019

Meeting of companies with European Commission.

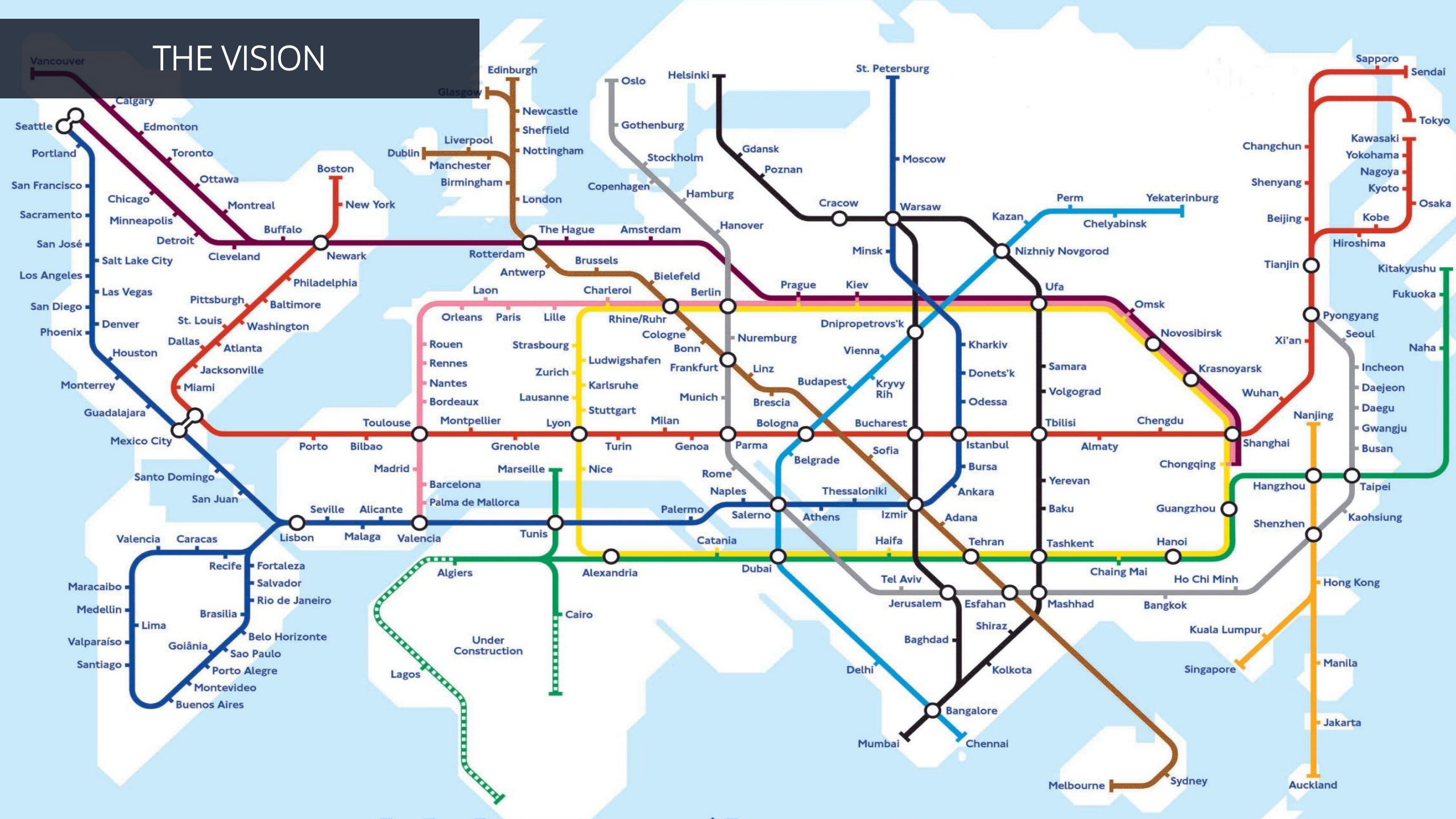
VISION FOR EUROPE

A hyperloop network in Europe could reduce aviation and trucking emissions, augmenting the share of high-efficiency, all-electric ground transportation.

Potential:

- Reduction of GHG emissions from trucking and aviation
- Enhanced competitiveness in ultra-high-speed transport
- Economic development of the EU regions
- High-value job creation and attraction/retention of talent
- Integration of the EU research infrastructures & centers
- Increased capacity of the EU transport network
- Cohesion of the different Members States

THE VISION


Vancouver
Calgary
Seattle
Edmonton
Portland
Toronto
Ottawa
San Francisco
Chicago
Montreal
Sacramento
Minneapolis
Boston
New York
San José
Detroit
Buffalo
Salt Lake City
Cleveland
Newark
Los Angeles
Las Vegas
Philadelphia
San Diego
Pittsburgh
Baltimore
Denver
St. Louis
Washington
Phoenix
Dallas
Atlanta
Houston
Jacksonville
Monterrey
Miami
Guadalajara
Mexico City
Santo Domingo
San Juan
Valencia
Caracas
Maracaibo
Medellin
Lima
Valparaíso
Santiago
Recife
Fortaleza
Salvador
Rio de Janeiro
Brasilia
Belo Horizonte
Goiânia
Sao Paulo
Porto Alegre
Montevideo
Buenos Aires
Seville
Alicante
Lisbon
Malaga
Valencia
Porto
Bilbao
Madrid
Barcelona
Palma de Mallorca
Toulouse
Montpellier
Grenoble
Marseille
Algiers
Tunis
Lagos
Under Construction
Cairo
Alexandria
Edinburgh
Glasgow
Newcastle
Sheffield
Liverpool
Dublin
Nottingham
Manchester
Birmingham
London
The Hague
Amsterdam
Rotterdam
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Brussels
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Charleroi
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Berlin
Rouen
Rennes
Nantes
Bordeaux
Strasbourg
Zurich
Lausanne
Cologne
Bonn
Frankfurt
Nuremburg
Munich
Ludwigshafen
Karlsruhe
Stuttgart
Linz
Brescia
Lyon
Turin
Milan
Genoa
Parma
Bologna
Rome
Naples
Palermo
Salerno
Catania
Nice
Oslo
Helsinki
Gothenburg
Stockholm
Copenhagen
Hamburg
Hanover
Gdansk
Poznan
Cracow
St. Petersburg
Moscow
Warsaw
Minsk
Dnipropetrovs'k
Prague
Kiev
Vienna
Budapest
Kryvy Rih
Kharkiv
Donets'k
Odessa
Belgrade
Sofia
Bucharest
Istanbul
Bursa
Ankara
Thessaloniki
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Bangalore
Mumbai
Chennai
Dubai
Kazan
Perm
Yekaterinburg
Chelyabinsk
Nizhniy Novgorod
Ufa
Omsk
Novosibirsk
Krasnoyarsk
Samara
Volgograd
Tbilisi
Almaty
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Chengdu
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Ho Chi Minh
Bangkok
Chaing Mai
Kitakyushu
Fukuoka
Naha
Pyongyang
Seoul
Incheon
Daejeon
Daegu
Gwangju
Busan
Nanjing
Hangzhou
Taipei
Kaohsiung
Shanghai
Hong Kong
Kuala Lumpur
Singapore
Manila
Jakarta
Auckland
Melbourne
Sydney

ZELEROS

Welcome to the future of transportation

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