



Could HYPERLOOP enhance the Physical Internet's efficiency ?

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FUNDAMENTAL PROBLEMS

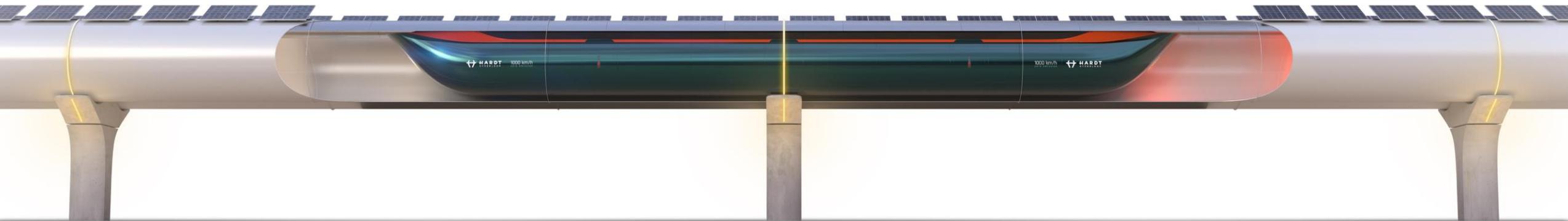
TRENDS AND DRIVERS in the growing demand for transportation that need to be addressed by fundamental shared solutions

- Increased stress and congestion on existing infrastructure
- Shift towards sustainability
 - Transportation sector believed to consume more than half of petroleum and produce almost a quart of global greenhouse gas emissions
 - There is no alternative to aviation

“5TH MODE OF TRANSPORT”

- History:
 - 2013: Elon Musk – “Hyperloop Alpha concept”
(L.A. – San Francisco: 560 km in 35 min)
 - Space X (Elon Musk) test track 1,6 km (1mile) California
 - 2015 – Hyperloop Pod Competition:
University teams developing the best “vehicle”
- Different European initiatives:
Poland (HyperPoland), Spain (Zeleros), France and Italy (TransPod)
- Global research & development:
India, Helsinki-Stockholm (business case), feasibility study DP World Dubai (containers), Russia, Paris-Amsterdam, Amsterdam-Frankfurt (Hardt), Toronto-Montreal (TransPod), California (Hyper Chariot), ...

WHAT IS THE HYPERLOOP TRANSPORT INSIDE A LOW- PRESSURIZED TUBE. THE IDEAL CONDITIONS FOR FAST AND LOW-ENERGY TRAVEL



Specifications

Max cruise speed
Longitudinal acceleration
Lateral acceleration

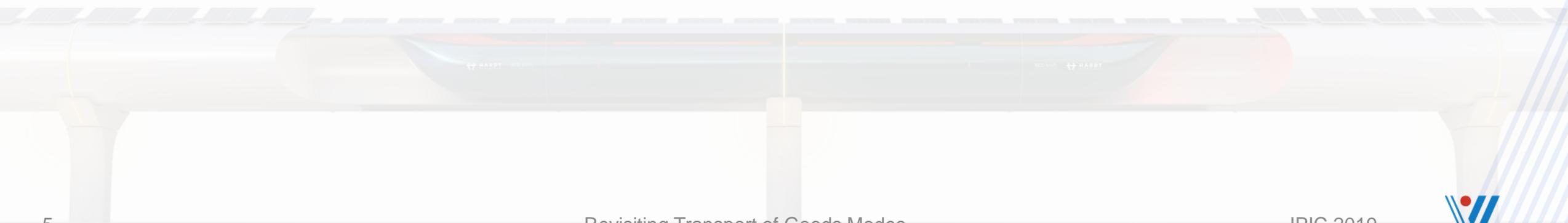
1000 km/h
0.15G
0.1G

Capacity
Length
Diameter (Excluding Bogie)

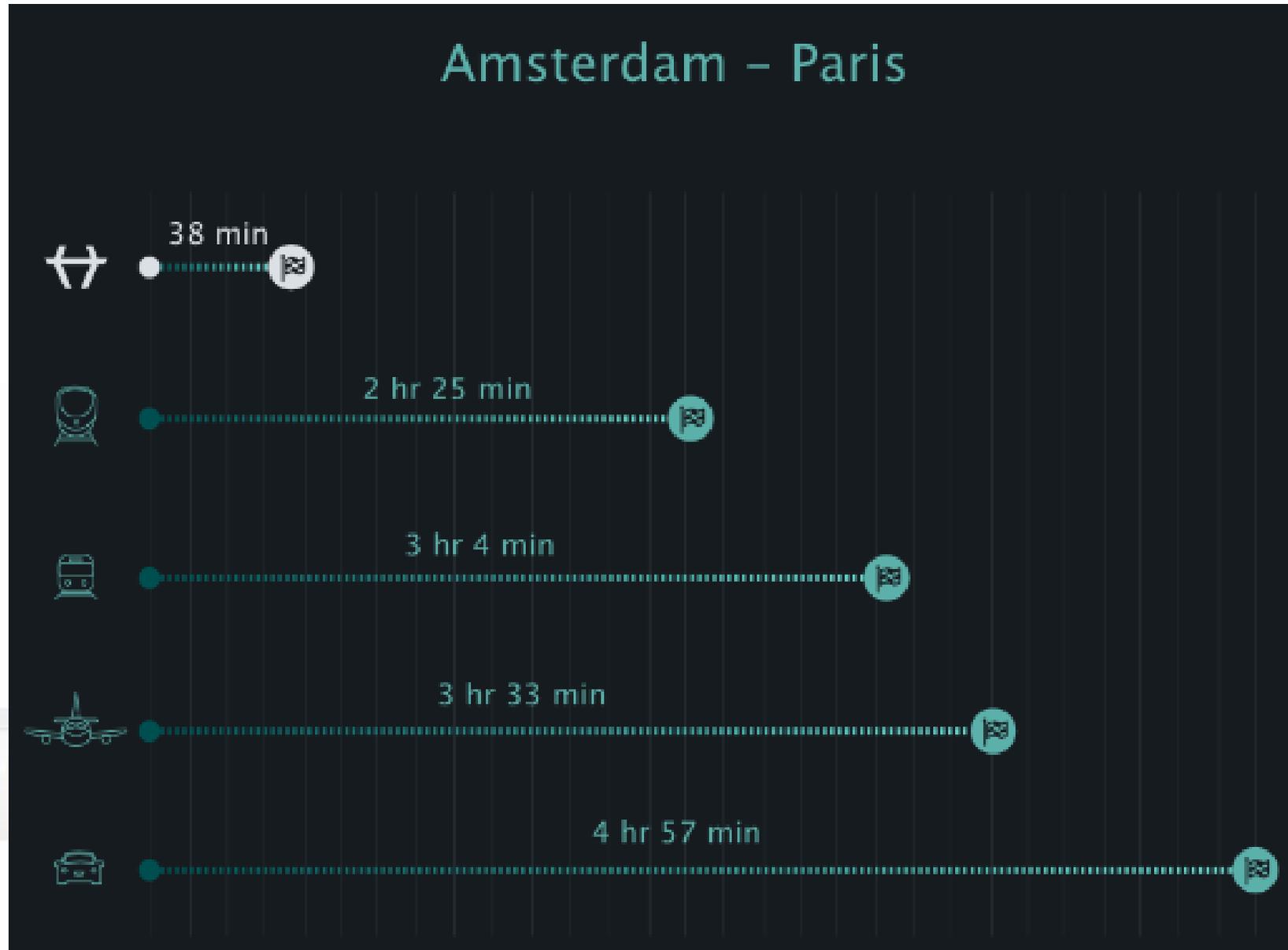
60 PAX
32M
2.7M

WHY ?

- Solves a fundamental problem
- Proposes a disruptive solution
- Uses breakthrough technology
- Boosts competitiveness of the economy
- Shared collaboration between Government, Industry, research institutions and universities

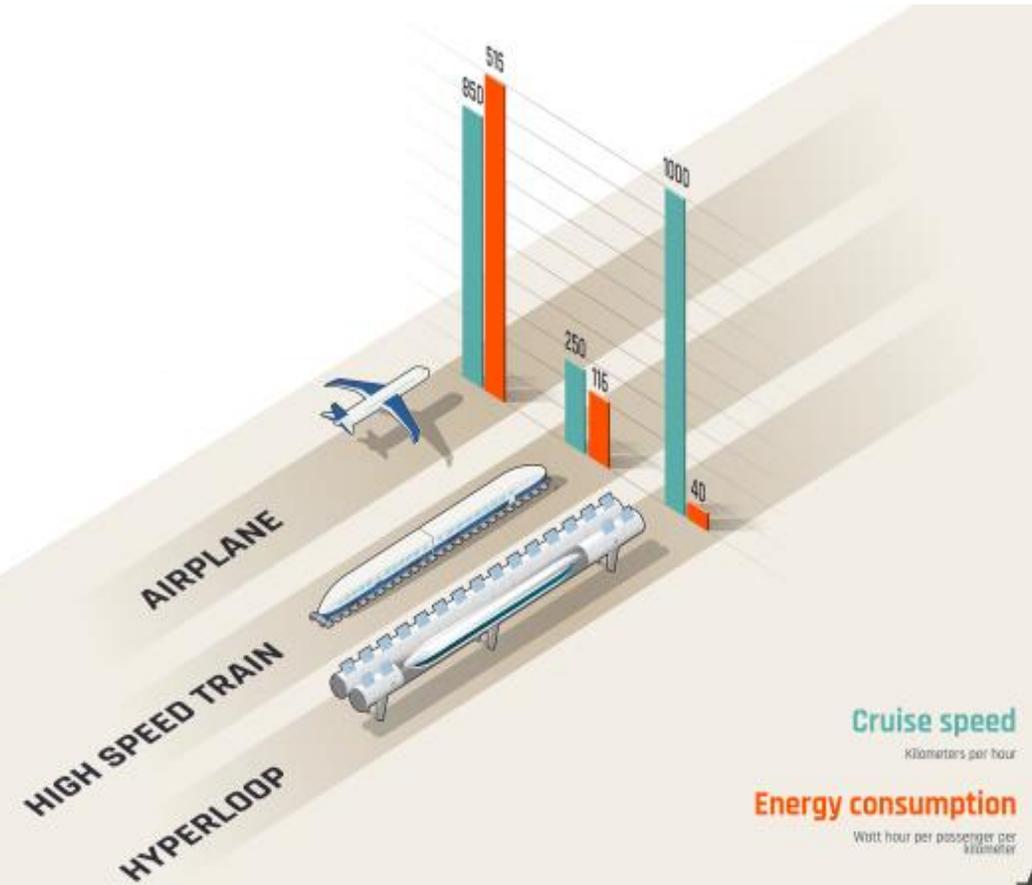


SPEED



FOCUS

- Hyperloop as a disruptive, sustainable and competitive alternative for air travel/air cargo
 - Within Europe
 - Passenger and cargo traffic to, from and between airports and city centres
 - Direct connections, simple lane switches and diversions and high frequency



Cruise speed
Kilometers per hour

Energy consumption
Watt hour per passenger per kilometer

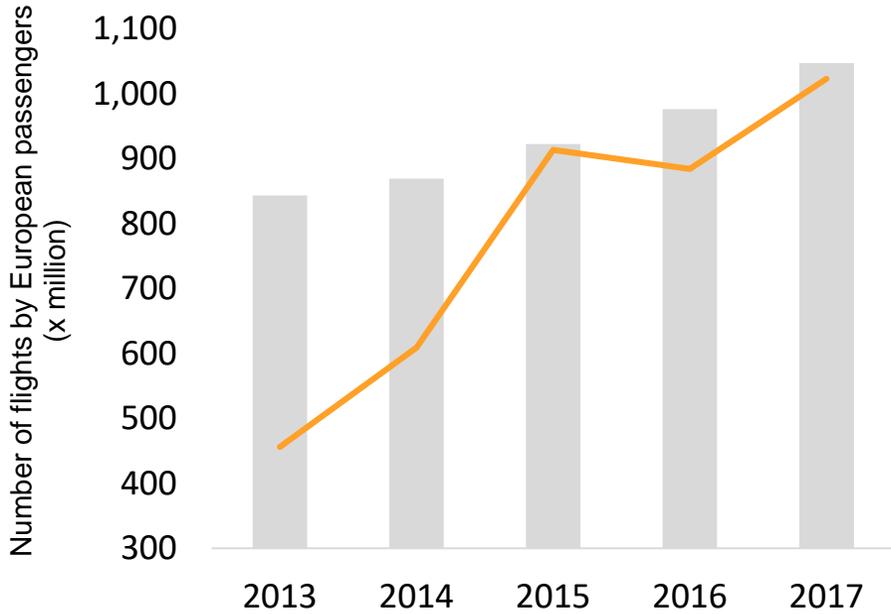


FOCUS ON PASSENGERS



1 B ANNUAL EUROPEAN PASSENGER FLIGHTS WITH A TOTAL OF 600B KM

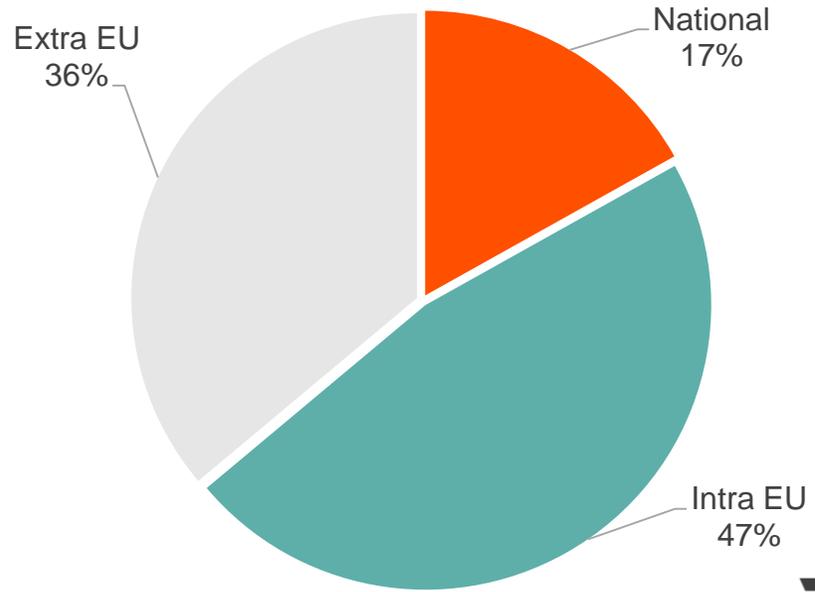
Aviation demand has grown substantially to more than 1 billion of annual flights¹



8%
7%
6%
5%
4%
3%
2%
1%
0%

annual growth rate in flights taken by European passengers

64% of all flights are within EU boundaries



¹ Source: Eurostat (avia_paoc)



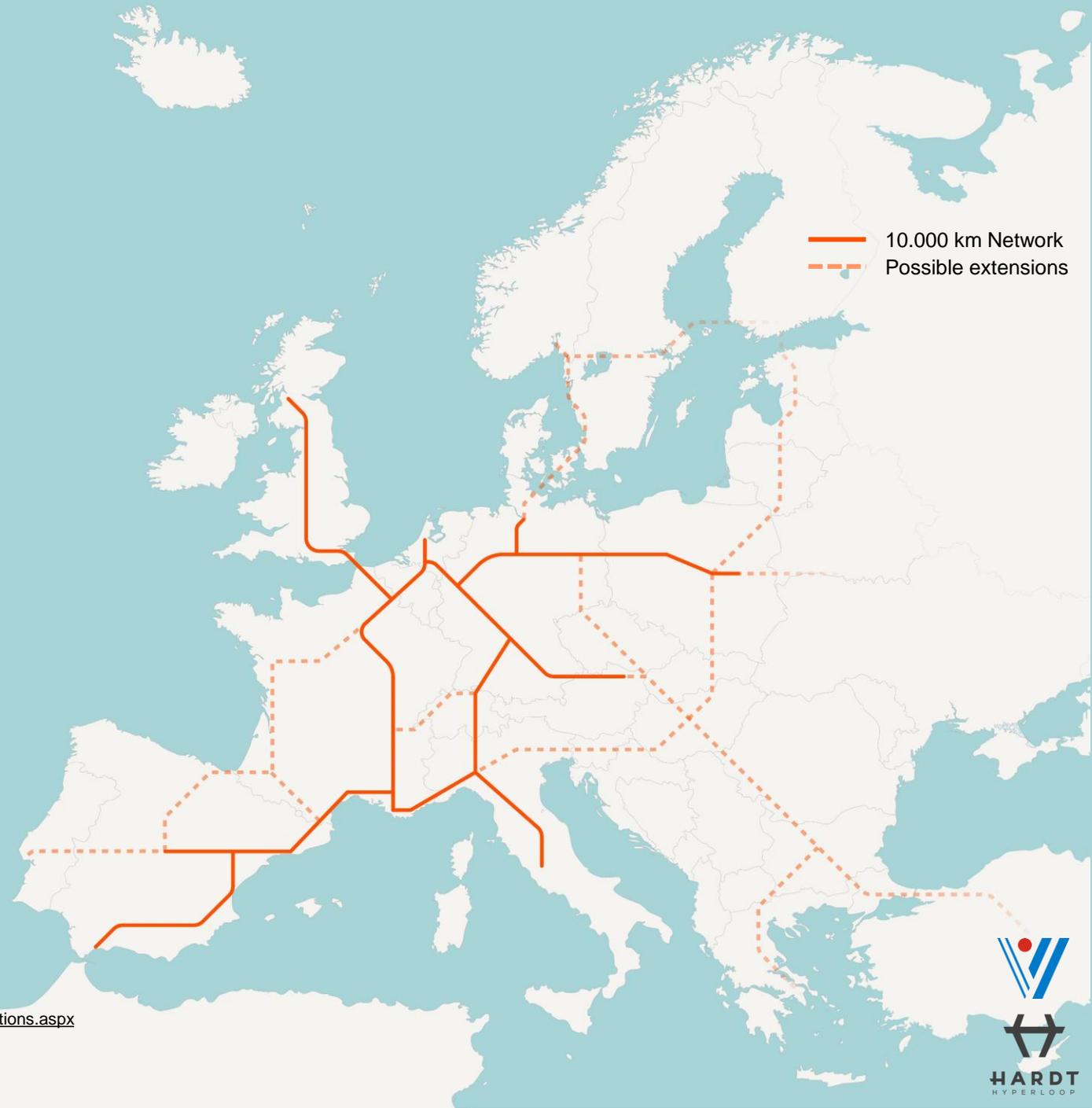
FOCUS ON FREIGHT

- 35 % of global trade by value = air freight
- Market driver: e-commerce
- About 50% of air cargo is 'belly freight'
- Transition of connected flows



**A hypothetical
10.000 km
European hyperloop
network would be
able to take over 65%
of the flights within
the EU.**

**20.000 km will take
over 80%**



1. <https://www.bcg.com/publications/2018/narrowing-sdg-investment-gap-imperative-development-finance-institutions.aspx>

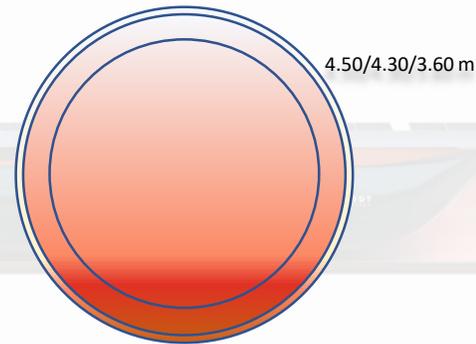
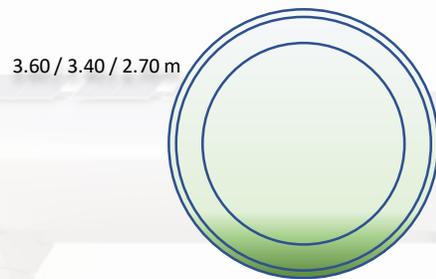
TO BE AND NOT TO BE

TO BE

- Augment existing infrastructure where possible, underground where necessary
- One (1) standard + international regulation

NOT TO BE

- Underground pipelines (ind. *3)
- Multiple standards



TO BE AND NOT TO BE

TO BE

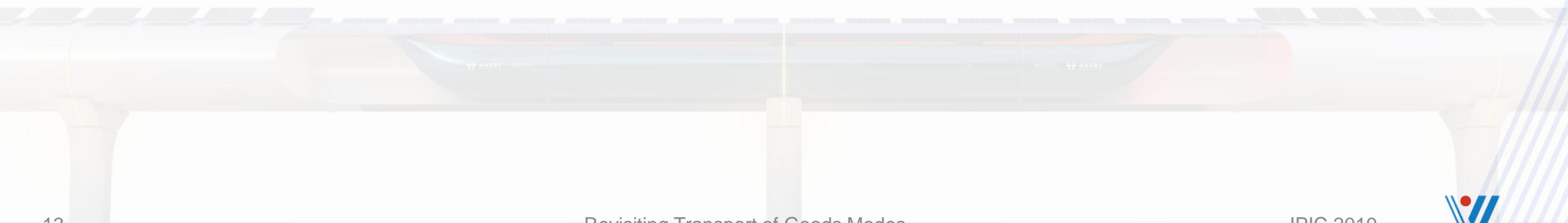
- Maximal flexibility by direct connections, diversions and high frequency
- Network deployable for passengers AND cargo

NOT TO BE

- A patchwork of A to B lanes
- Individual lanes for EITHER passengers OR freight

RELEVANCE FOR PHYSICAL INTERNET

- Misconception of the relevance of speed for the physical internet
 - As fast as required – ‘good enough’
- Physical Internet is a living and connected network
- Hyperloop is a connected network
- Hyperloop could be a future ‘bedfellow’ to aviation fulfilling the same (and new) needs as aviation today
- Hyperloop clicks into that part of the supply chain and economy that fulfils the on-demand need



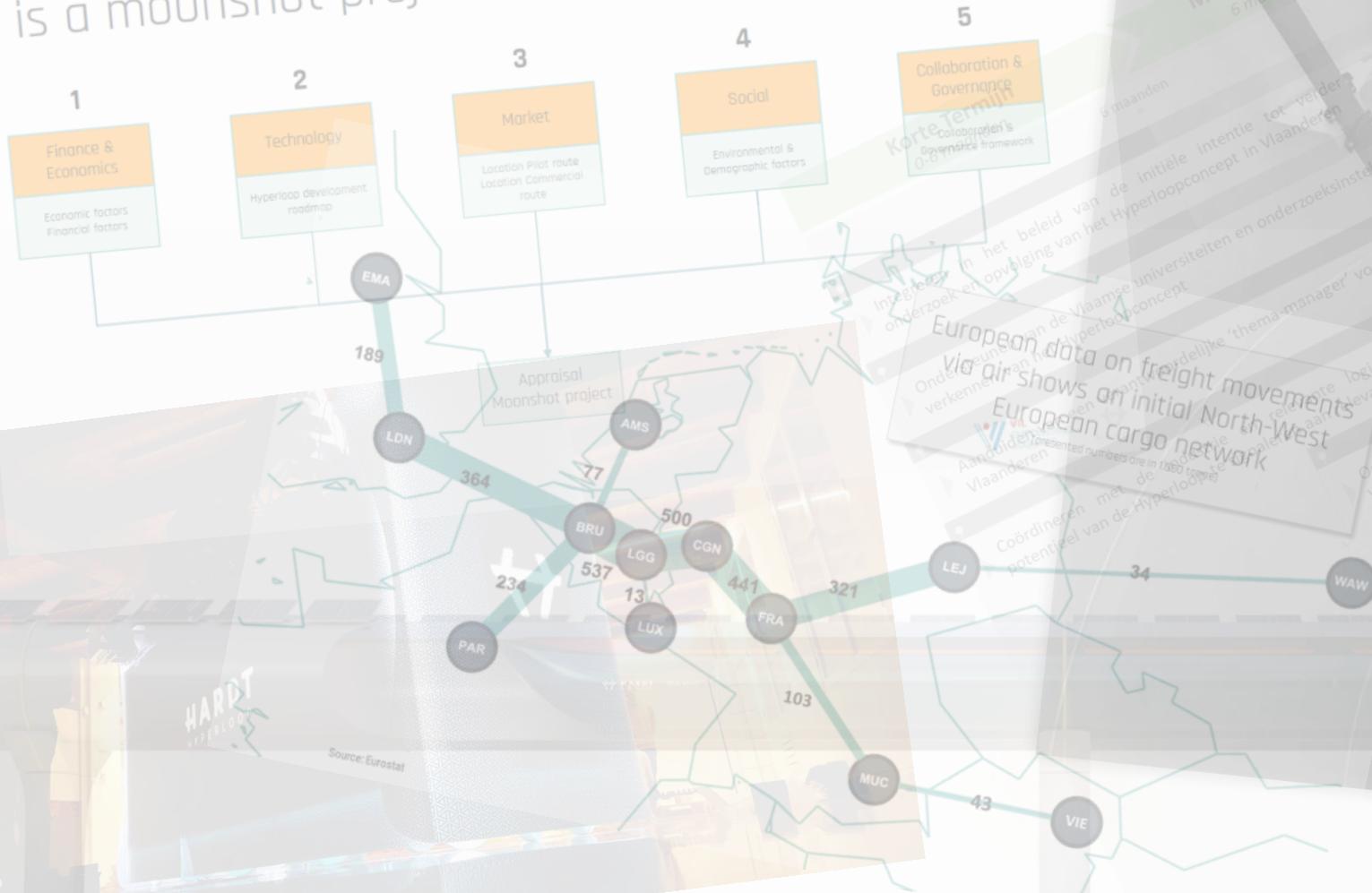
PRE-REQUISITES: EUROPEAN PERSPECTIVE

- Additional research, development and testing
- Standardisation
- Legislative, regulatory and liability frameworks
- Governance models
- Routes and Acceptance
- Investment



WHAT IS HAPPENING ?

Economic feasibility study to prove hyperloop is a moonshot project



European data on freight movements via air shows an initial North-West European cargo network

Middellange Termijn
6 maanden - 5 jaar

Lange Termijn
+5 jaar

5 jaar

Korte Termijn
0-3 maanden

Integratie in het beleid van de Vlaamse universiteiten en onderzoeksinstituten in het onderzoek en opvolging van het Hyperloopconcept

Ontwikkeling van de Vlaamse universitaire en onderzoeksinstituten in het onderzoek en opvolging van het Hyperloopconcept

Aanduiden van de Vlaamse universitaire en onderzoeksinstituten in het onderzoek en opvolging van het Hyperloopconcept

Coördineren met de Vlaamse universitaire en onderzoeksinstituten in het onderzoek en opvolging van het Hyperloopconcept

Participeren in de ontwikkeling van het Hyperloop-ecosysteem in Vlaanderen, door middel van financiering en subsidies

Uitvoeren van gedetailleerde technische en economische haalbaarheidsstudie naar de Hyperloop in Vlaanderen

Opzetten van een agentschap voor de ontwikkeling van een Hyperloop

Bouw en operationalisering van een Hyperlooptraject, indien haalbaar en interessant



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