This project has received funding from the Shift2Rail Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement no. 826055 (TER4RAIL)

TER4RAIL PROJECT FINAL EVENT

Arguments for Rail

TER4RAIL – ERRAC- 19.11.2020

Franco Castagnetti –NEWOPERA
Giuseppe Rizzi –UITP

WP3 ARGUMENTS FOR RAIL

D3.1: DATA AND STUDIES HANDBOOK

This research evidenced that Rail continued to build capabilities despite limited traffic gains but creating conditions for acceleration the growth in the future

- High speed rail & cross border developments
- Local transport & smart mobility
- Incentives & Pricing policies
- Network & infrastructure
- Fleet & Rolling stock

D3.1.1 UITP Metro
D3.1.2 UITP Light Rail

D3.1.3 NEWO Freight & Log
D3.1.4 NEWO Social, Envir.

Considerable Value of this research is the consolidation in one document of 232 pages of all data, facts, figures, charts

WP3 ARGUMENTS FOR RAIL

D3.2 D 3.3: RAIL AS BENEFIT FOR EU SOCIETY

SWOT analysis, bottlenecks & gaps, emerging trends and scenarios, comparing with other modes summarizing most of the analyzed elements such as:

- Investments & innovations
- Costs and service performances
- Sustainability & Energy efficiency
- Evolution and utilization of electric vehicles
- Impacts of environmental variables, climate change
- Economics and Society evolution
- Gaps and barriers to be overcome
- Differences in member States
- Impact of digitalization

WP3 ARGUMENTS FOR RAIL

D3.3 SWOT ANALYSIS - RAIL OVERALL

	STRENGTHS	WEAKNESSES
INTERNAL	• **Sustainability, energy efficiency and easier energy transition, safety differential also in future projections** • **Cost advantages in scale economies, long distances, high co-modality potential** • **Growing industrialization benefits from exponential technologies, interoperability, modularization** • **Core and Extended Network drive towards EU Rail area connecting most population and all big mobility nodes** • **HSR is rejuvenating all Rail ecosystem** • Limited de-bottlenecks to be overcome for satisfying demand and service growth • Local passenger transport solutions are fitting specific/relevant needs in self contained areas	• **Long lead time for implementing new services, investments, design/plan/build/ on new infrastructures/technologies** • **High capital intensity** • **Service performances not always competitive, inadequate mobility service integration in co-modal mind-set** • Slow EU harmonization • Multiple actors with inadequate collaborative Rail ecosystem approach • Aging staff with unclear replacement plans • Inadequate internationalization and competitive patterns • Limited service segmentation not always “inclusive” for passengers. • Limited exploration of innovative use of available resources for synergies (HSR, City logistics, Postal/Express Services, …)

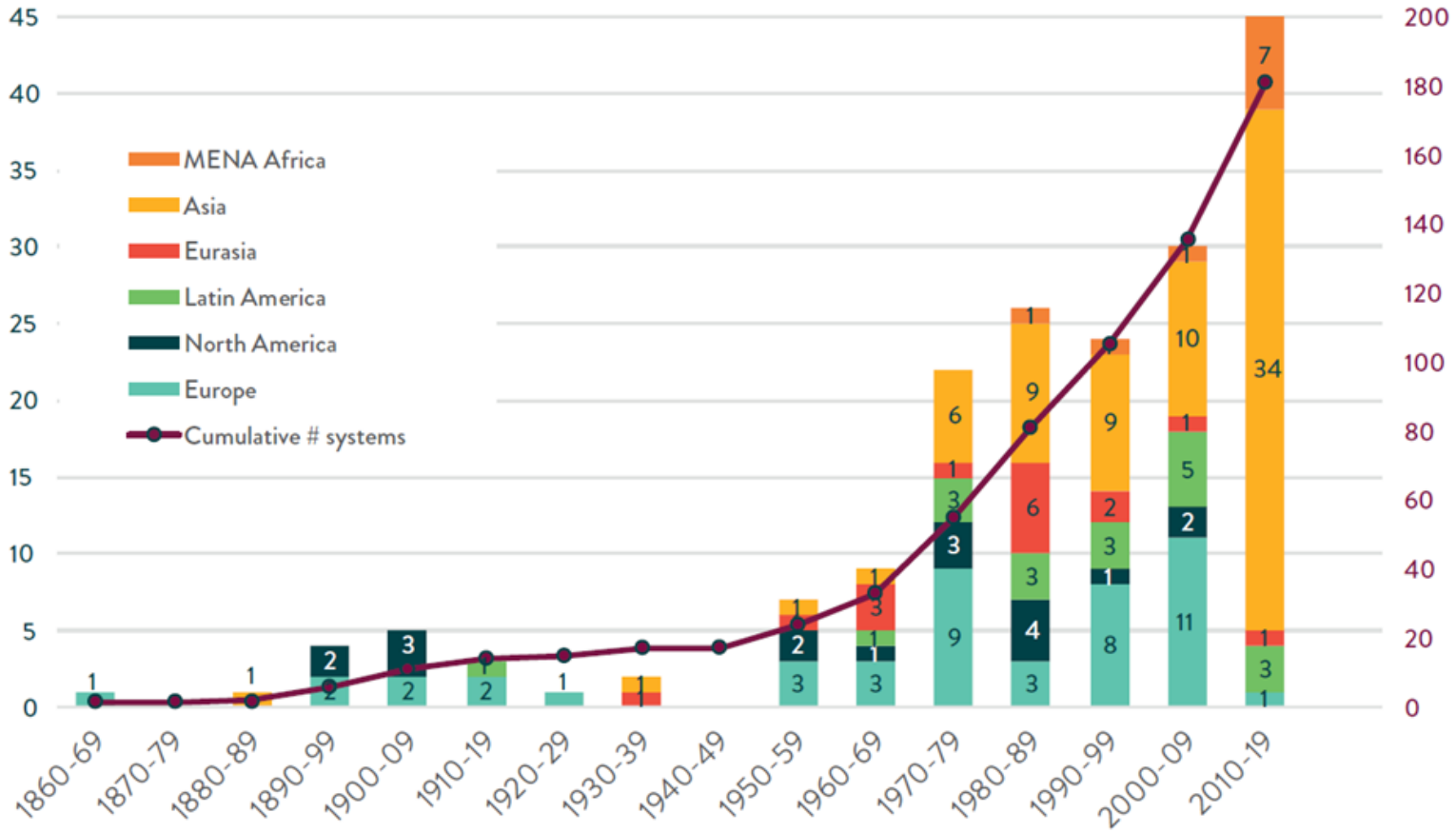
WP3 ARGUMENTS FOR RAIL

D3.3 SWOT ANALYSIS - RAIL OVERALL

	OPPORTUNITIES	THREATS
EXTERNAL	• **Fiscal policies favouring more sustainable modes and Rail centrality in co-modal perspective** • **Acceleration of policy developments in favour of public transport** • Growing demand patterns in future projections fitting Rail Developments of light assets collaborative/ virtual integrated new business models and public/private partnership • Resiliency and mobility growing R&D capabilities for managing dynamics • Co-modal integration through long term more efficient time/space planning • Faster acceleration towards responsible mobility after COVID 19	• Rail is a high capital-intensive business, public resources are limited • The EU Commission efforts for creating a uniform Rail space area are sometimes finding obstacles due to local interests of limited vision • Faster reaction of other modes to adopt ICT and exponential technologies and other dynamics

WP3 ARGUMENTS FOR RAIL

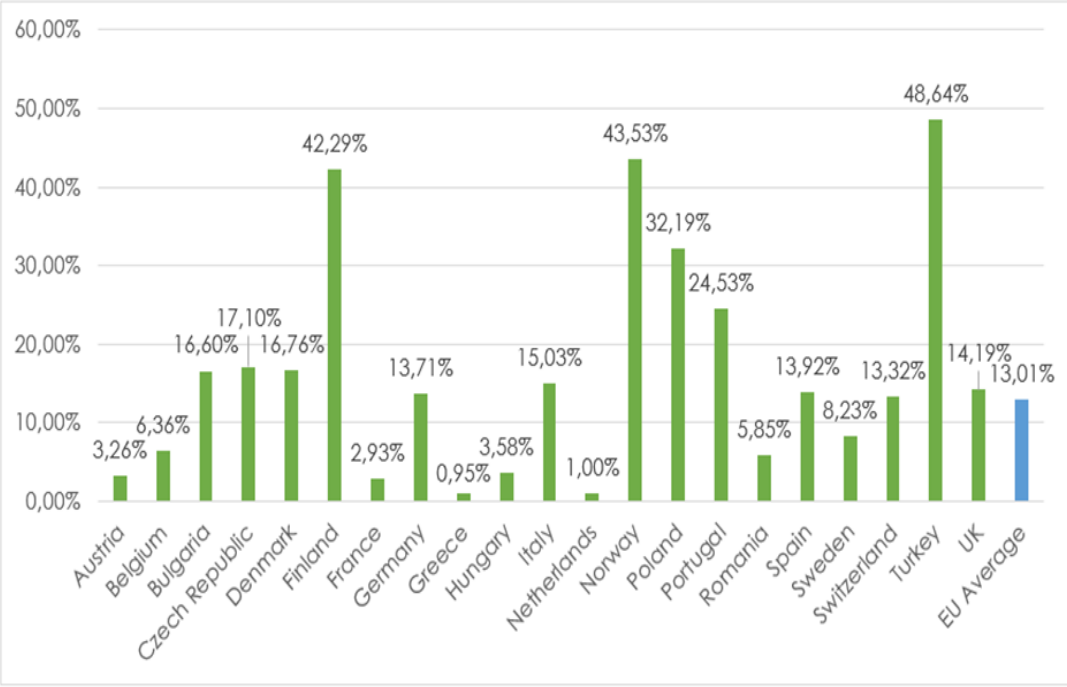
D3.1 EU & GLOBAL OFFERING GROWTH - METRO



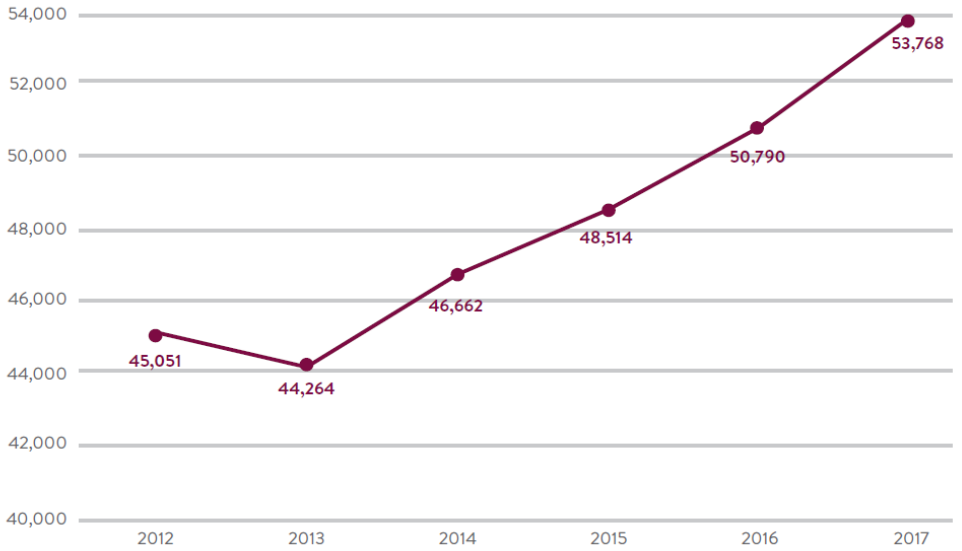
Metro systems openings per decade and cumulative number of systems (1860-2019) - Source: UITP Statistic Brief, World Metro Figures 2018

WP3 ARGUMENTS FOR RAIL

D3.1 METRO RIDERSHIP EVOLUTION



Metro ridership evolution in Europe by Country (2013-2018) – Source: UITP elaboration



Global ridership evolution worldwide (million pax, 2012-17) – Source: UITP Statistic Brief, World Metro Figures 2018

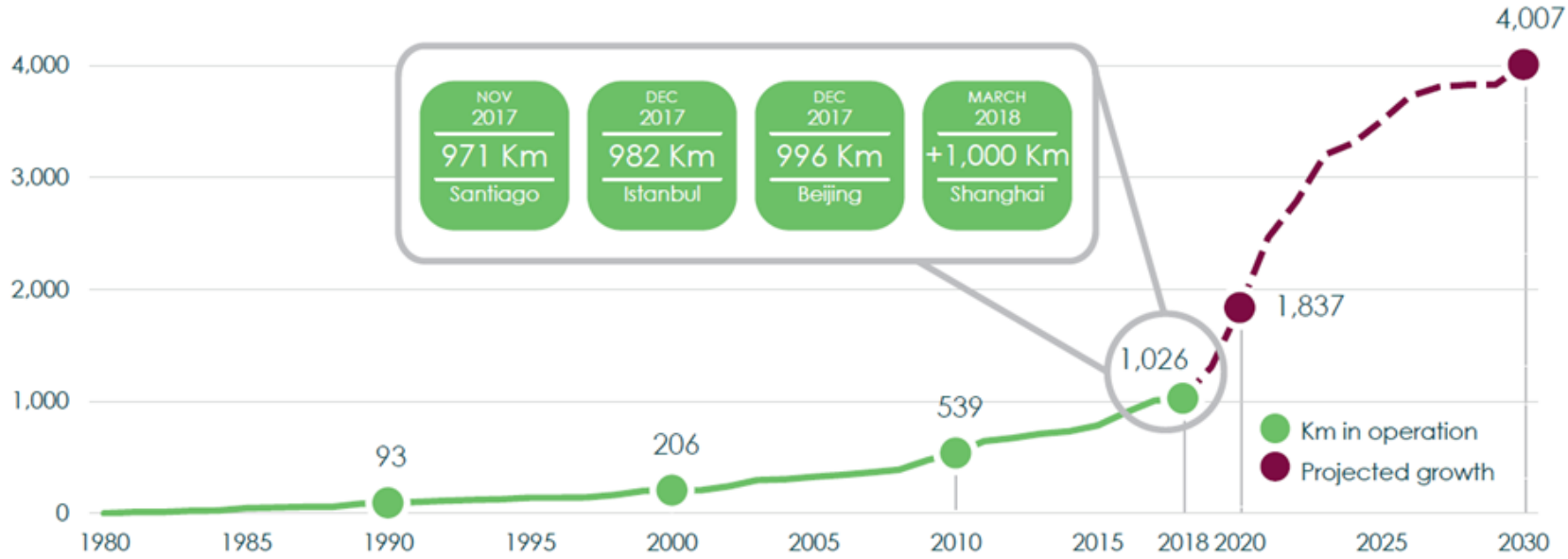
11 BILLION TRIPS IN 2018 +13% VS. 2013

European champions in terms of:

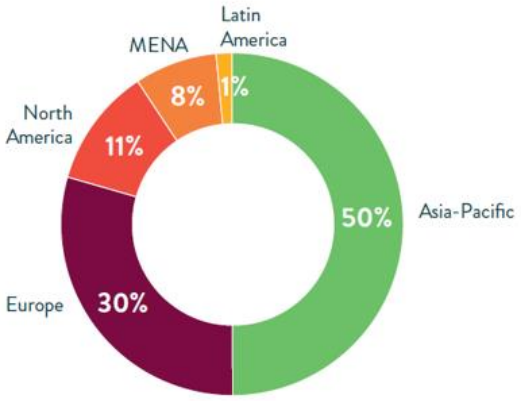
- **Ridership**
- **Number of carriages**
- **Network length**
- **Number of stations**

WP3 ARGUMENTS FOR RAIL

D3.1 NEW TECHNOLOGIES IN INVESTMENTS - METRO



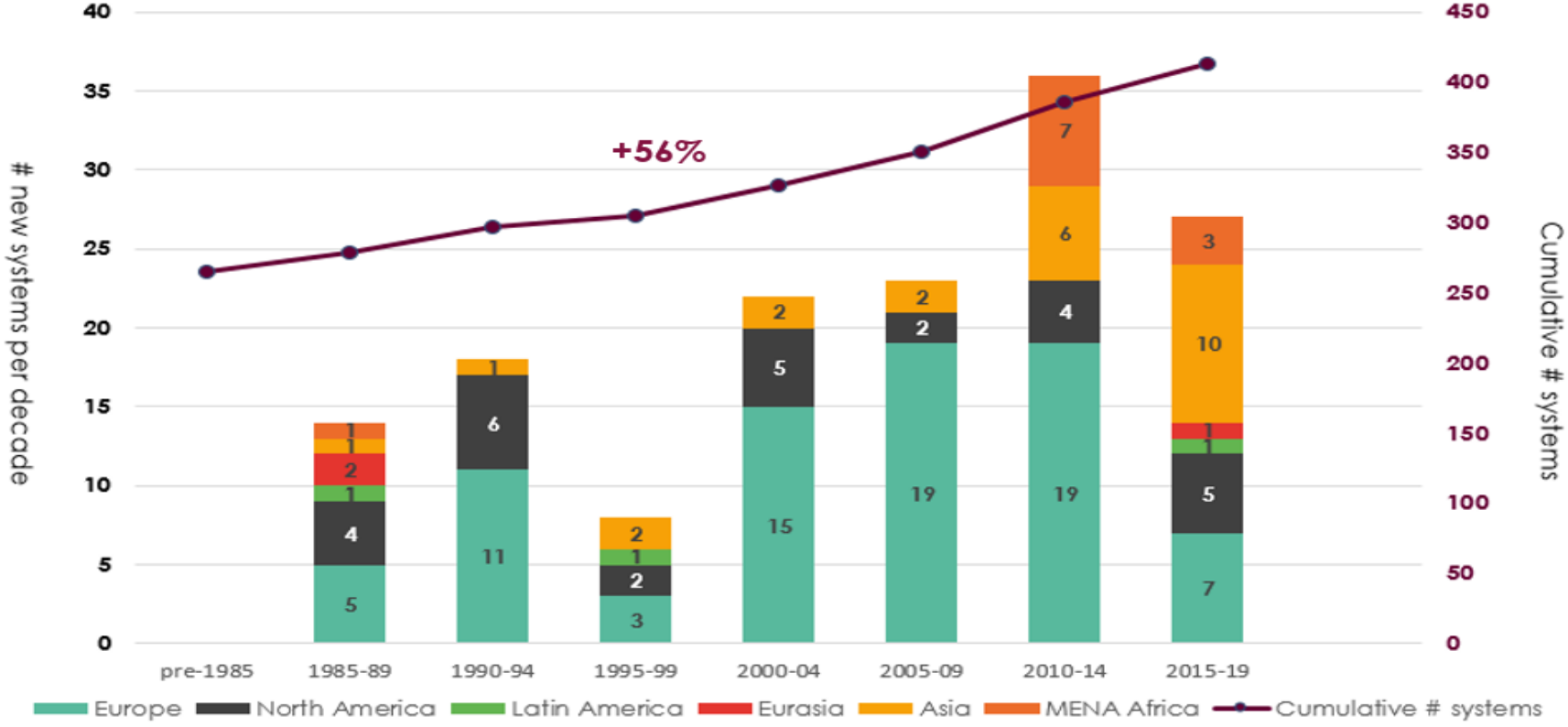
Total growth in automated metros, measured as km in operation - Source: UITP Statistic Brief, World Report on Metro Automation (2019)



7 European **conversion projects** from conventional to automated metros. Total length: from current 303 to **611 km in 2028**!

WP3 ARGUMENTS FOR RAIL

D3.1 EU & GLOBAL OFFERING GROWTH - LRT



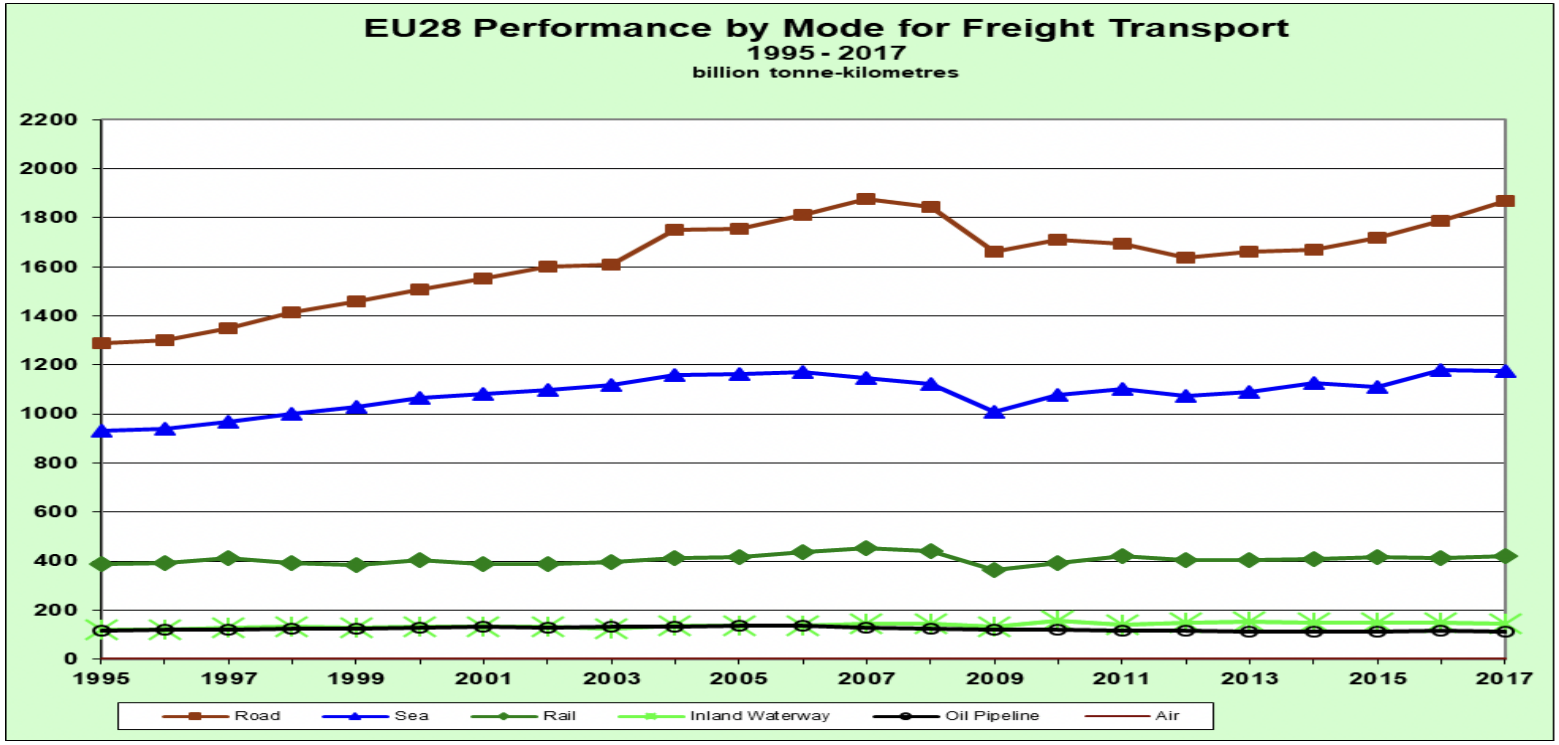
LRT system opening per half-decade 1985-2019 – Source: UITP LRT Statistics Report 2019

EUROPE: world champion in LRT

WP3 ARGUMENTS FOR RAIL

D3.3 FREIGHT PERFORMANCE

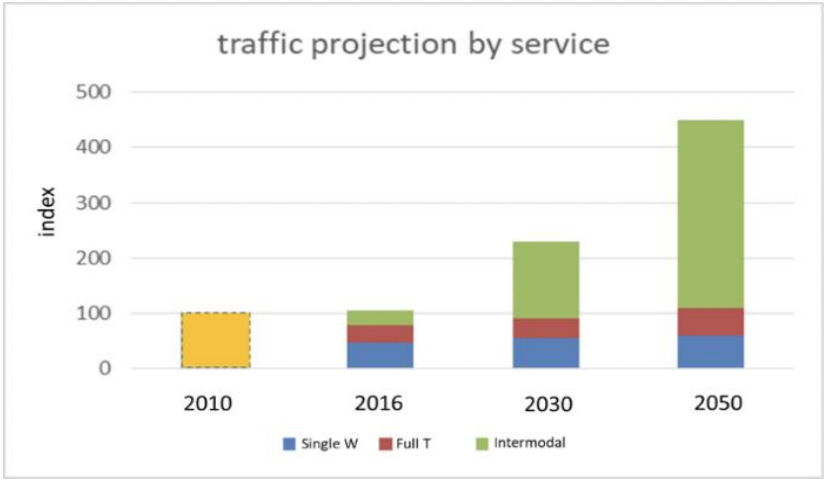
- Rail performance is constant over time: from 2000 on, the growth 0.8% per year
- Despite limited traffic growth capacity and capability have continued to grow



EU performance by mode of transport
Source: Publications Office of the European Union - STATISTICAL POCKET BOOK 2019 (data 2017) - EU TRANSPORT in figures

WP3 ARGUMENTS FOR RAIL

D3.3 WHAT CAN TRIGGER AN EFFECTIVE MODAL SHIFT?

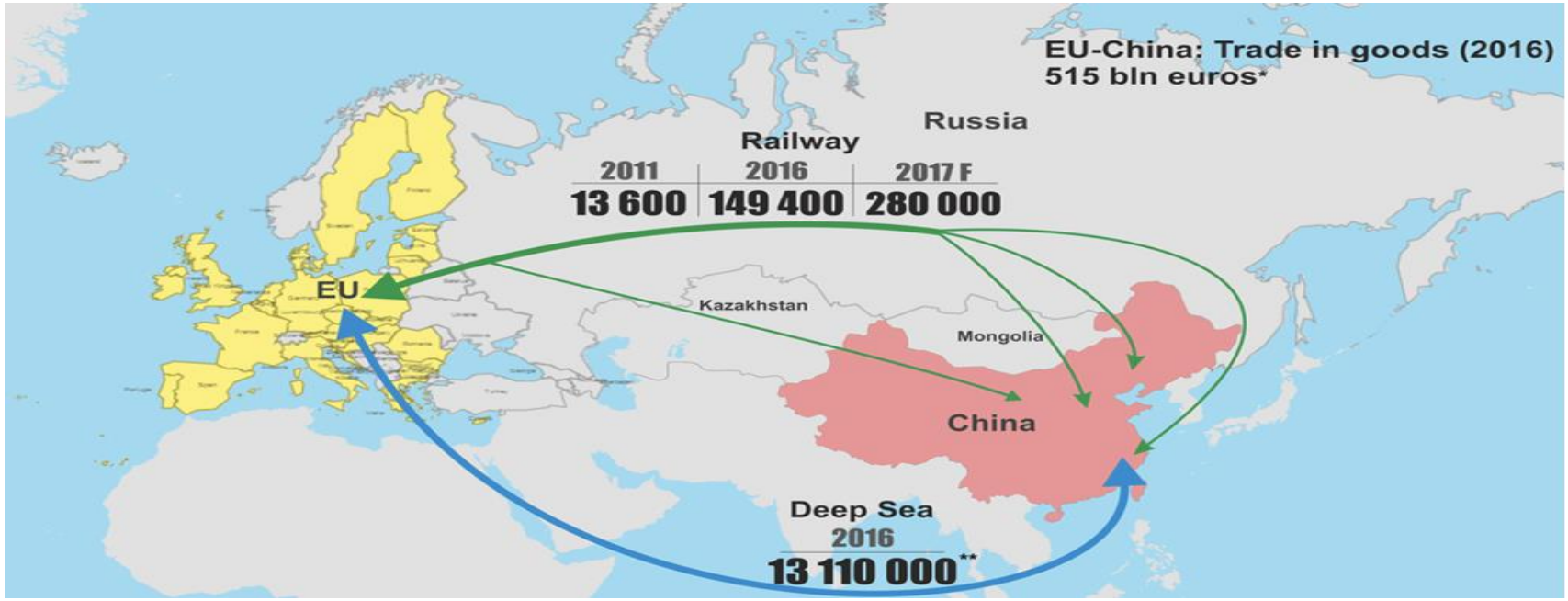


- Longer, heavier trains
- HST in the same-day-delivery market
- Integrated vertical offerings
- Coordinated offerings to cluster of users with similar or complementary requirements
- Service concentration in traffic attraction zones leveraging ICT both in operations and in marketing, with logistics engineering support.
- Enhanced planning and controlling processes
- Better service marketing consistently aligning the operations (e.g. transit time and reliability can become assets)
- More consistent/extended application of the EU directive reserving capacity to rail freight (Regulation EU 913/201018)

WP3 ARGUMENTS FOR RAIL

D3.3 OPPORTUNITIES FOR RAIL – ROUTES ABOVE 900 KM

- Opportunities can arise from: Lower cost than road transport, Shortage of truck and drivers, Increase in labour cost for drivers
- Rail transport is considered effective on distances no lower than 300 km and extremely competitive on trips longer than 900 km.
- Rail grew considerably between 2011 and 2017.



EU-China trade in goods (rail-deep sea) in 2016 (in TEUs)
Source: FERRMED, November 2017, re- elaboration on Eurostat 2017 database

WP3 ARGUMENTS FOR RAIL

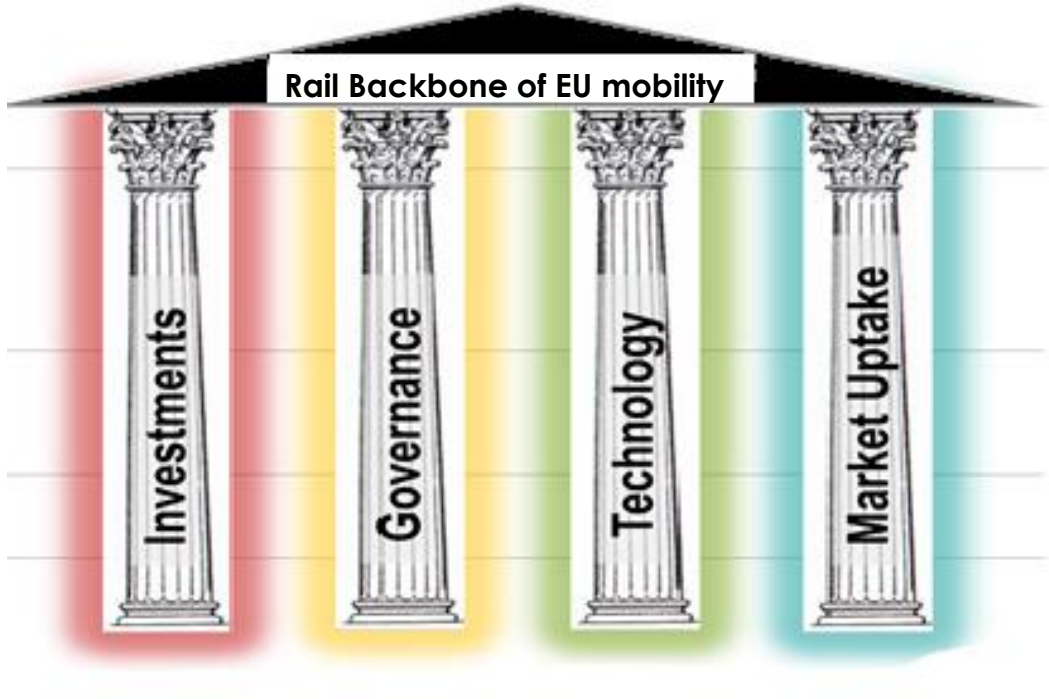
D3.3 OPPORTUNITIES FOR RAIL – ROUTES BELOW 900KM

- **Between 300 and 900 km** :
  - ✓ Service and cost performance improvements
  - ✓ Collaboration with Rail from Road industry resulting from its reduced fragmentation
  - ✓ Better reading of traffic flows according to new societal needs
- **Below 300 km**:
- The pollution benefit of rail in the modal shift on short distances consists of: Less congestion & Contribution to scale economies
- Key areas which could see a greater presence of rail such as Container traffic management in ports, Metropolitan waste movements and City logistics solutions,

WP3 ARGUMENTS FOR RAIL

D3.3 CONCLUSIONS

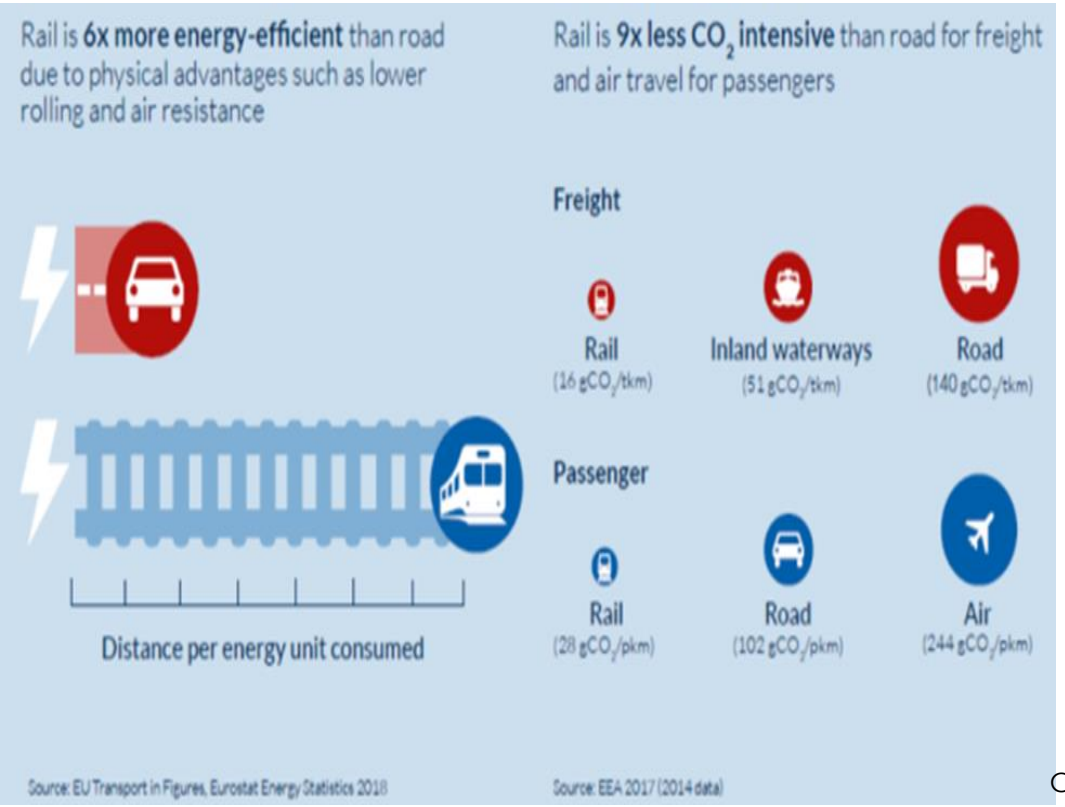
- Rail to play a fundamental role in EU mobility. Rail services Market capabilities expected to increase
- Rail to play a more significant role in a modern co-modal mobility for sustainability, capacity, energy & cost better than other modes
- Rail connections in metropolitan areas, within Europe and beyond are set to increase



- Longer and heavier trains to contribute increasing role of rail in freight mobility
- High-Speed Trains will enable rail to enter into new markets
- Faster, more flexible & reliable services allow higher competitiveness over road/air

WP3 ARGUMENTS FOR RAIL

D3.3 SUSTAINABILITY ADVANTAGES



Comparison of energy efficiency and CO2 emissions – Source: CER Factsheet (2014)

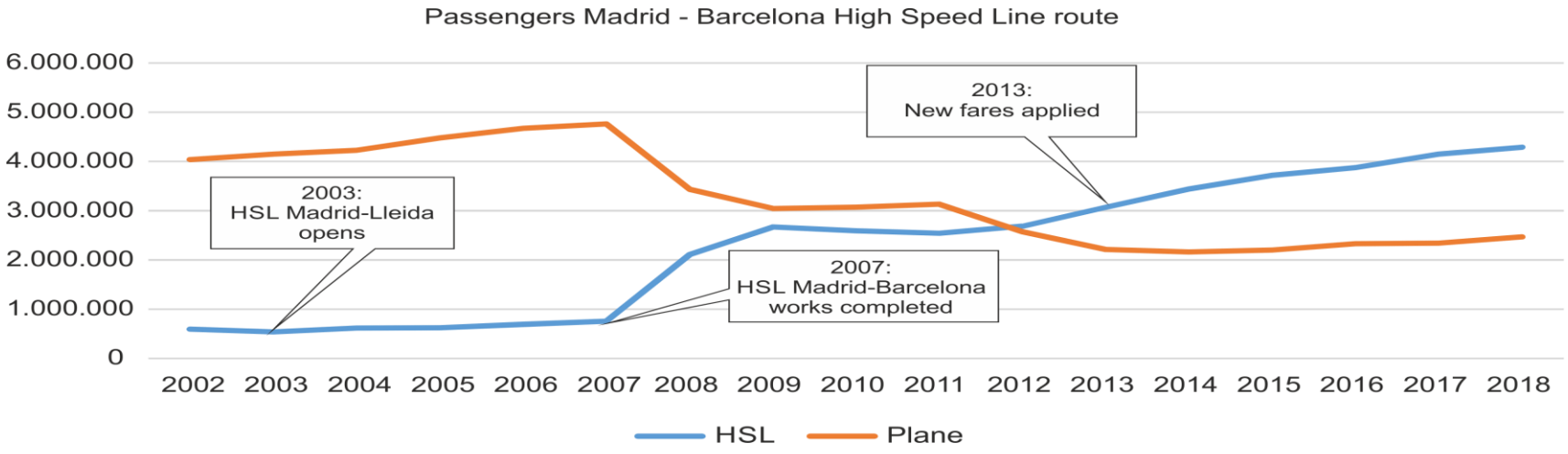
Cross Impact crucial to achieving progress – source Spider Plus project

WP3 ARGUMENTS FOR RAIL

D3.2 SUCCESS STORIES

Story: Madrid-Barcelona HSR

- **Inauguration** date: 20/02/**2008** - strong "business" vocation
- Total length: 663 kilometres; Max speed: 300 km/h -2h 30 travel time
- **-4.2 million tonnes** of **CO2**/year -13 kg/person, plane: 92kg, car: 74kg
- **Regenerative braking** -6-10% energy return
- Lightweight & efficient **materials**; **Better refrigeration**/AC -30% energy save
- Customer satisfaction: 8.23/10 rating



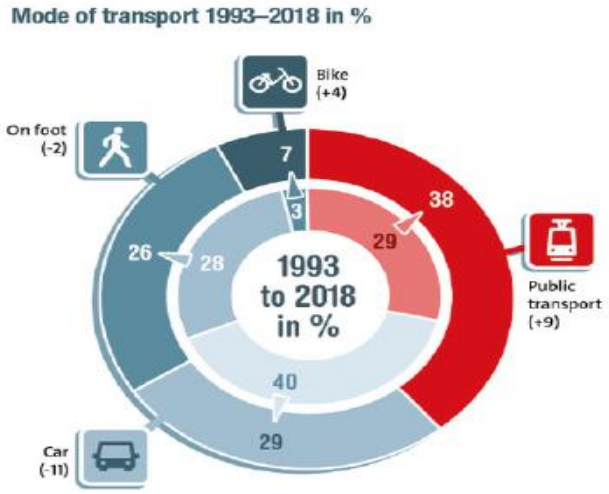
IN LINE WITH 2011 EC WHITE PAPER TARGETS (3X HSR LENGTH BY 2030)

WP3 ARGUMENTS FOR RAIL

D3.2 SUCCESS STORIES

Story: Vienna

- **Metro+LRT** main "engines" of the Vienna PT system (**79.5%** of the total **ridership** - **+40%** 1995-2018) - Plans to increase e-mobility >50% of fleet by 2030
- Huge **investments** in PT since 2010 (extension-construct. of metro lines, automation, new junctions between lines & modes, new vehicles
- Customers' **satisfaction** surveys: **>95%** positive rates
- **WienMobil**: single app combining many transport modes (planning & booking tool)



WP3 ARGUMENTS FOR RAIL

D3.2 SUCCESS STORIES

Story : Nantes

- Nantes Metropole (NM): structure of 24 cities – 590.000 inhabitants;
- **Re-opening** of tram lines in **1985**. Urban rail chosen as preferred mode –
- 2018: 43Km of tramways -3 lines, 91 stations, **expansion programmes**-;
- **Park & Ride** facilities: incentives to leave the car and use the PT;
- Keys: efficient timelines, **accessibility** (event PRM), clear **communication**, **engagement** with users, **easy** intermodal **connections**, **safety** & maintenance;
- Results: 300.000 people use the PT every day **+54% ridership** in 10 years, first French city to reduce cars market share, 210 PT trips per inhabitant/year.

1998

2001

1988

1997

WP3 ARGUMENTS FOR RAIL

D3.2 SUCCESS STORIES

Story: Marathon Train

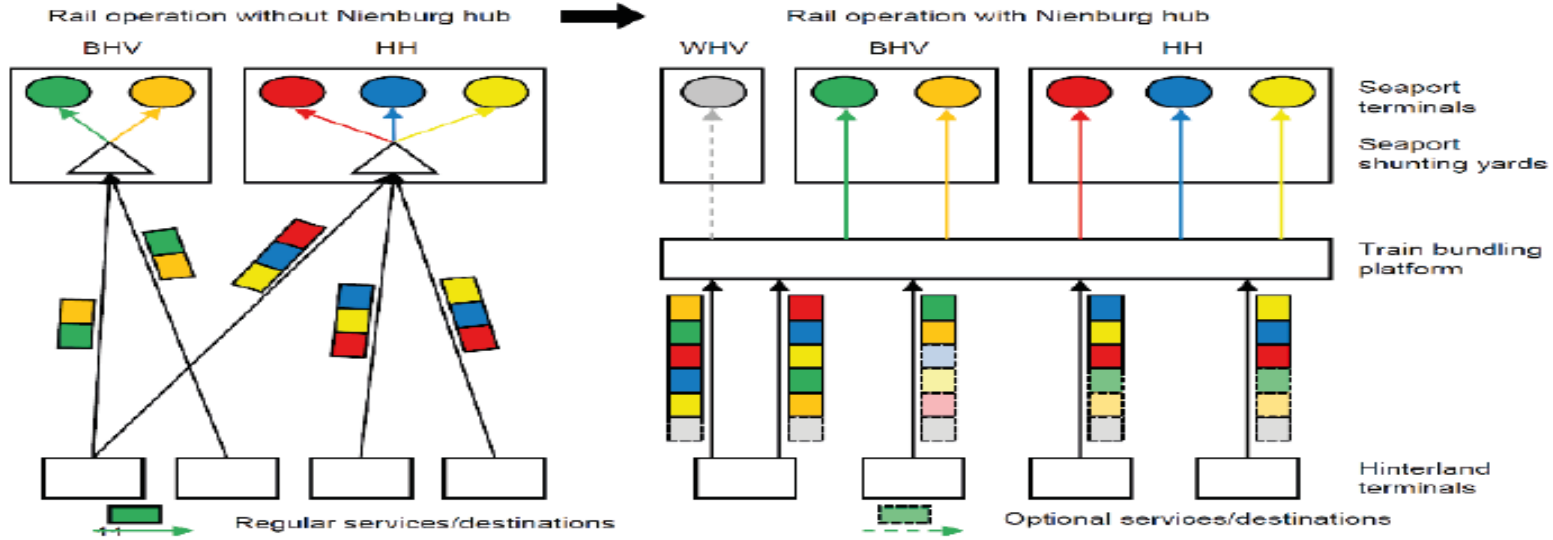
- **Longest train** in Europe (1524m) - combination of 2x750m standard trains;
- 72 wagons - 4026 tons carried from Lyon to Nimes in real conditions;
- **2 locos**: 1 in the front - 1 in the middle radio commanded;
- 100km/h commercial speed;
- 2 tests performed (1 with 2 diesel - 1 with 2 electric locos);
- Results: **-30%;operating costs**; **+50% capacity**; **+10% energy saving**;

WP3 ARGUMENTS FOR RAIL

D3.2 SUCCESS STORIES

Story: TIGER Dry Ports

- **New distribution system** via Dry Ports (4 tests)
- Train **capacity +15-20%;** Increased **handled volumes**;
- **Reduced** shunting **movement** inside the port;
- **Reduced dwelling & transit time** (Genoa -37%; Hamburg -92%);
- **Optimized** sea terminal **slot utilisation** and **accessibility**;
- **Punctuality** +85-90%; **Reduced** port **congestion**;
- **Reduced emissions** & **accidents**.



TER4RAIL
Transversal Exploratory
Research Activities for Railway

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THANK YOU FOR YOUR ATTENTION

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More on:
www.ter4rail.eu