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# **FUTURE LOGISTICS – TRENDS, CHALLENGES AND OPPORTUNITIES**

24.11.2022

# Agenda

- **What is shaping the future logistics?**
- **What are the main trends and targets affecting logistics?**
- **What is needed to develop competitive logistics systems in future?**

# Future logistics?

**” Foresight of the future  
= facts + imagination”**

**(Hiltunen, 2021)**



# Megatrends

*“A general direction of development consisting of various phenomena and entailing widespread change, such as the ecological sustainability crisis.”*

*“Megatrends are often considered to occur at the global level and the development is often considered to continue in the same direction.”*



**Climate change**



**Population growth**



**Demographic change**



**Urbanization**



**Globalization**



# MEGATRENDS FOR THE 2020s



**Increase in wealth and consumption**



**Inequality**



**Eco-crisis and resource reduction**

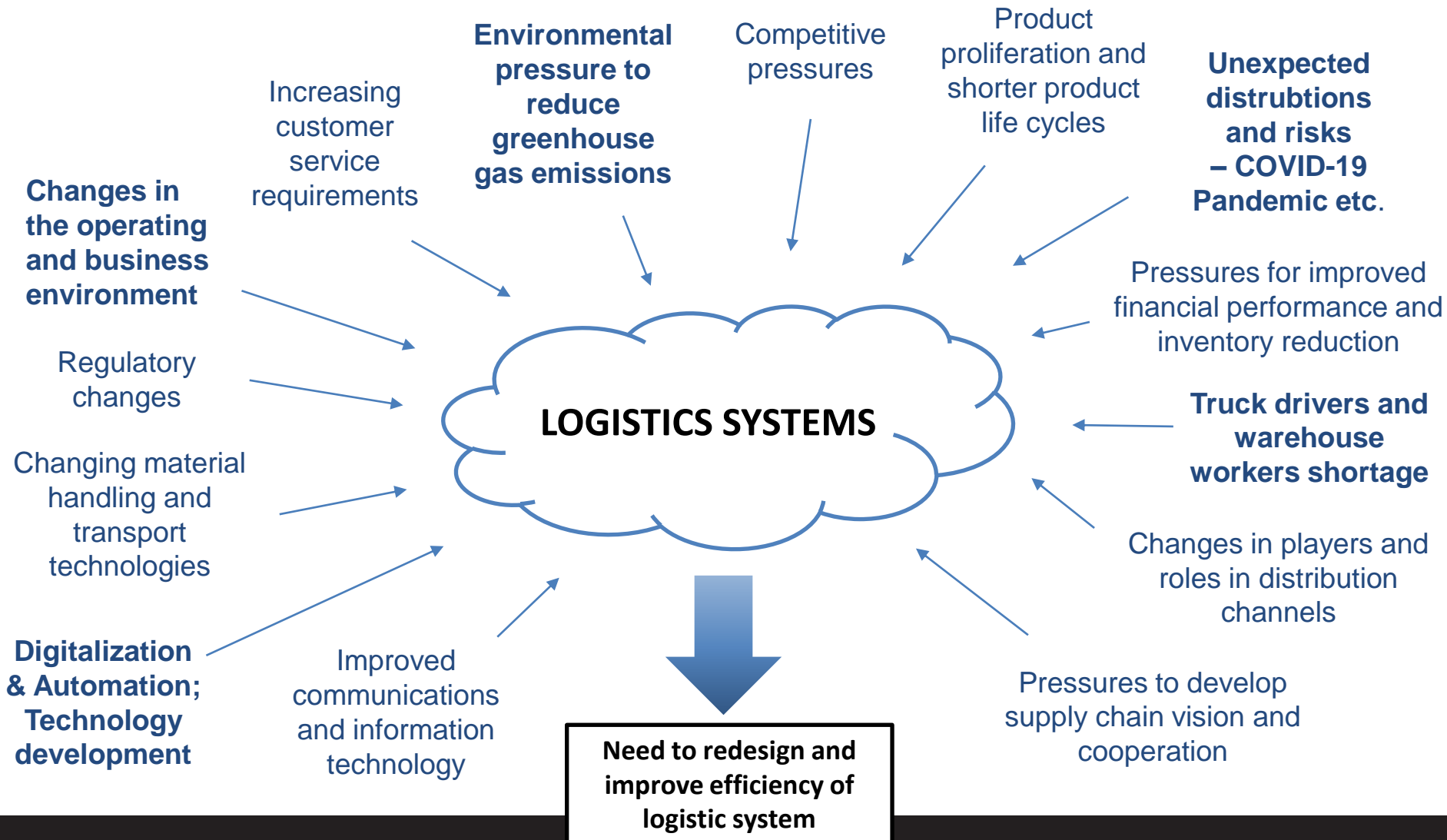


**Digitalization**



**Technology development**

# Pressures influencing on future logistics systems



# Future of work in logistics – Three forces of change



## 1) Shifting Demographics

- For the first time in history, digital natives are beginning to outnumber those who began their careers before the internet
- Long experience and know-how disappears
- Competition to attract and Retain new workers

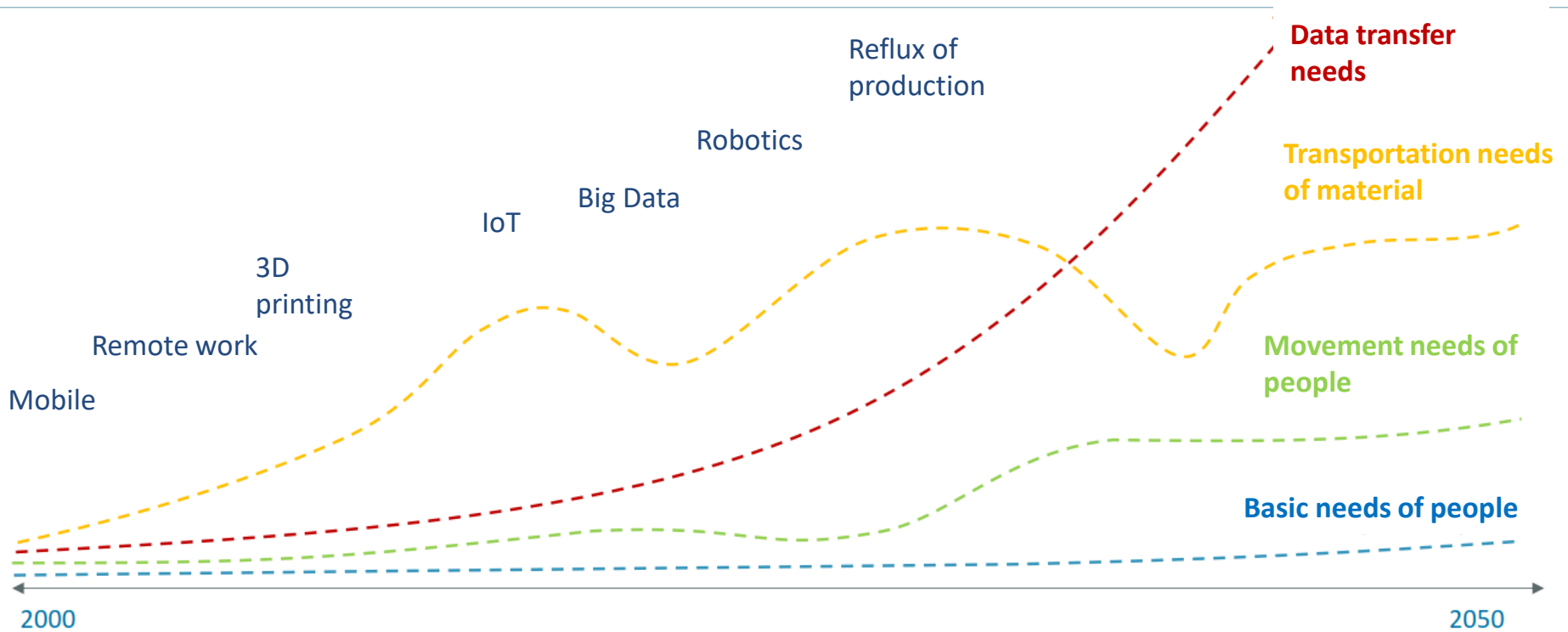
## 2) Technology Advancement

- It is estimated that 29% of all current workplace tasks are done by machines. This is expected to grow to 52% by 2025.
- Continual improvements in the realms of digitalization, automation, and artificial intelligence (AI)

## 3) COVID-19 Pandemic

- In a matter of days and weeks, a microscopic virus managed to initiate changes that would normally take years or even decades for organizations and industries to adopt
- Increasing e-commerce
- Hybrid work policies and remote-work technologies

# Time spans - Development of different needs





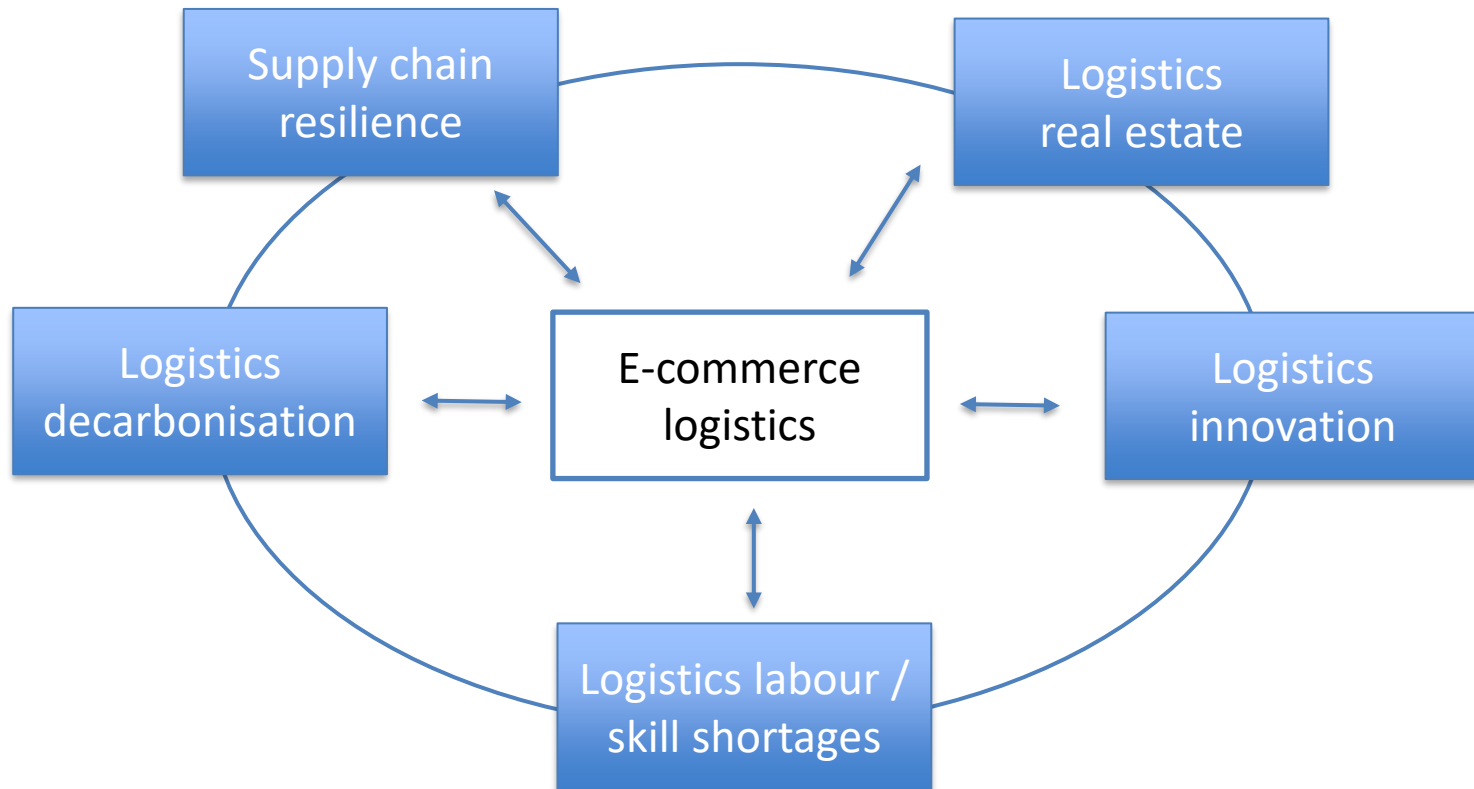
# The dilemma

**On the other hand logistics is a prerequisite for economic development and social equality,**

**but**

**on the other hand logistics inevitably(?) causes negative environmental and social impacts.**

# Logistics interacting megatrends



# Supply chain resilience

- *“The adaptive capability of a supply chain to prepare for and/or respond to disruptions, to make a timely and cost-effective recovery, and therefore progress to a postdisruption state of operations – ideally, a better state than prior to the disruption.”*

(Tuthamuhabwa et al. 2015)

- **Recent history of supply chain disruptions: creating need for greater strategic supply chain resilience**
- **For example, the COVID-19 pandemic has thoroughly stress-tested the resilience of supply chains**
  - Severe, diversified and dynamic multidimensional impacts
  - Impacts on all the nodes (supply chain members) and edges (ties) in a supply chain simultaneously
  - Supply, transportation, and manufacturing faced numerous challenges that reduce the capacities
  - Demand for necessary items such as personal protective equipment (PPE), ventilators, and dried and canned foods increased

(Chowdhury et al. 2021)

# COVID-19 pandemic – impacts on supply chains - Examples

Impacted area	Specific impact
Demand management	<ul style="list-style-type: none"> <li>• Demand spikes of essential products</li> <li>• Shortage of essential products</li> </ul>
Supply Management	<ul style="list-style-type: none"> <li>• Ambiguity or difficulty in forecasting</li> <li>• Shortage of material supply</li> </ul>
Production management	<ul style="list-style-type: none"> <li>• Production disruption and backlog</li> <li>• Reduced production capacity</li> </ul>
Transportation and logistics management	<ul style="list-style-type: none"> <li>• Delays in transportation and distribution</li> <li>• Lack of international transportation/trade</li> </ul>
Relationship management	<ul style="list-style-type: none"> <li>• Reduced social interaction</li> <li>• Information ambiguity</li> </ul>
Supply chain-wide impact	<ul style="list-style-type: none"> <li>• Supply chain collapse</li> <li>• Closure of facilities</li> </ul>
Financial management	<ul style="list-style-type: none"> <li>• Reduced supply chain financial performance</li> </ul>
Sustainability management	<ul style="list-style-type: none"> <li>• Lack of focus on social and environmental sustainability practices</li> <li>• Threats to the health and safety of the workforce</li> </ul>

(Chowdhury et al. 2021)

# Top 10 risks globally

*Climate change: extreme weather events – increasing risk to logistics systems and supply chains*

## Top 10 risks in terms of Likelihood

- 1 Extreme weather
- 2 Climate action failure
- 3 Natural disasters
- 4 Biodiversity loss
- 5 Human-made environmental disasters
- 6 Data fraud or theft
- 7 Cyberattacks
- 8 Water crises
- 9 Global governance failure
- 10 Asset bubbles

## Top 10 risks in terms of Impact

- 1 Climate action failure
- 2 Weapons of mass destruction
- 3 Biodiversity loss
- 4 Extreme weather
- 5 Water crises
- 6 Information infrastructure breakdown
- 7 Natural disasters
- 8 Cyberattacks
- 9 Human-made environmental disasters
- 10 Infectious diseases



## Categories

- ◆ Economic
- ◆ Environmental
- ◆ Geopolitical
- ◆ Societal
- ◆ Technological

# Logistics decarbonisation

## Logistics = 11-12% of global CO2 emissions

- Freight transport 9,6%
- Warehousing and terminals 1-2%
- Urban freight 14% of transport CO2, 1,7% of total CO2 emissions

## 5 logistics decarbonisation levers:

- 1) Reduce the Total Amount of Freight Movement
- 2) Shift Freight to Lower Carbon Transport Modes
- 3) Optimise the Utilisation of Vehicle Capacity
- 4) Increase Energy Efficiency of Freight Transport
- 5) Cut Carbon Content of Freight Transport Energy



# K GROUP BEGINS DELIVERIES WITH FIRST SERIES PRODUCED MAN FULLY ELECTRIC TRUCKS IN FINLAND

News 26.9.2019 13:11 | updated 26.9.2019 13:24

## IKEA to start emission-free deliveries in Tampere

PRESS RELEASE, RESPONSIBILITY, CUSTOMER, COMPANY, CLIMATE CHANGE, MEDIA / 08.10.2020 10:1

The company plans to begin a home delivery trial with electric trucks that will be the first of its kind in the Nordics.

Share



## The Road to Zero Emissions Now

With tightening emissions regulations on their way, fleets have an affordable and proven alternative for zero emissions today.



Plenary: Green Mobility and Decarbonization – TRA Lisbon 2022



# Logistics labour shortages

- **Pressure to improve labour productivity and automate**
- **For 75% of logistics providers and 45% of shippers "finding and retaining qualified labour" is major challenge (Inbound logistics survey 2022)**
- **Labour and skill shortages are multi-dimensional**
  - Geography: by country, region and delivery range
  - Sector: by industry, users and providers of services
  - Function: by transport, warehousing, IT, etc.
  - Mode: by trucks, vans, trains, air cargo etc.
  - Grade: across operative, supervisor, managerial levels

# Truck driver shortage – Where have all the truck drivers gone?

- **Widespread and diverse problem in Europe – worsened since 2017**
- **Several reasons behind**
- **Analysts and industry groups have warned of truck driver shortages already for years, around the globe**
- **Supply chain disruptions during the pandemic and surges in demand have made this slow-rolling crisis even much more acute**



*"It's a recruitment and retention problem"*

# Truck driver shortage – effects



- **Transporting goods by road is uncertain**
  - it is not as easy to get drivers as it used to be
- **Without drivers the goods cannot be transported by trucks**
- **Delays in road transport**
- **Arranging road freight transport on a fast schedule is challenging**
- **Case Brexit in Britain**
  - A shortage of different goods and fuel
  - Some of the transport is not received at all
  - Some transportable products have had to be destroyed (perishable products such as milk)

# Truck driver shortage

## Reasons behind

- More drivers quit than start
- New drivers are trained too few
- COVID-19 pandemic
- Industry exchange of Eastern European drivers
- Brexit
- Problems and challenges with other modes of freight transportation
- Increasing fuel price
- Exchange of Eastern European drivers
- ..

## Future solutions

- Keeping drivers in the industry
- Adding and recruiting more drivers
- Pandemic safety for drivers
- Training new drivers
- Brexit legislation changes
- Fuel price increase in moderation
- Automation
- Increasing transport capacity
- Optimization of transportation
- ..



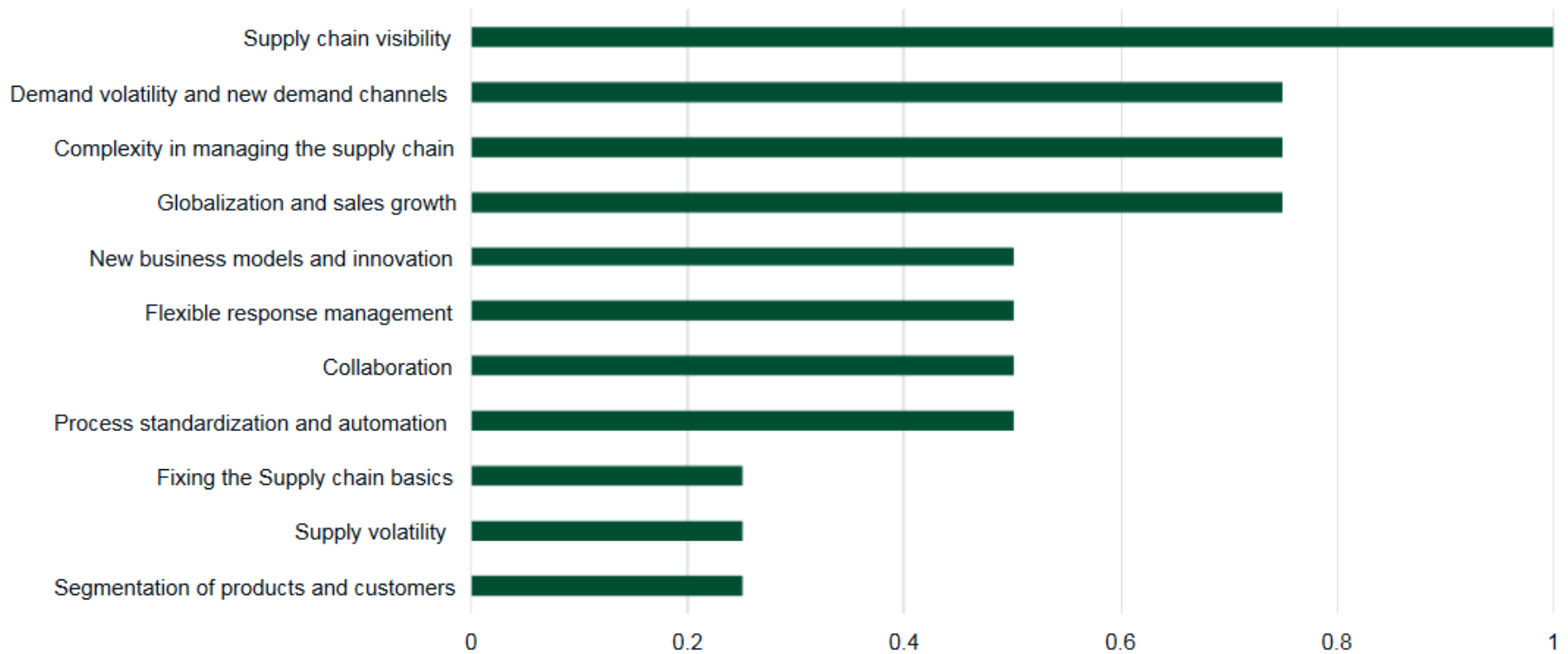
# Logistics innovations – Top 8 Supply Chain Technology Trends

- 1) Artificial intelligence
- 2) Advanced analytics
- 3) IoT
- 4) Robotic process automation (RPA)
- 5) Autonomous things
- 6) Digital supply chain twin
- 7) Immersive experience
- 8) Blockchain

*“As companies seek to exploit the benefits of greater levels of digitalization, new and innovative technologies, such as blockchain and artificial intelligence (AI)/machine learning, can potentially and significantly disrupt existing supply chain operating models,” (Christian Titze, VP Analyst Gartner)*



# Improving supply chain visibility is perceived to be the most important challenge across all industries



Rating of the key challenges within current and future SCM

# The growth of e-commerce – How will it affect urban logistics?



# Innovations Distribution - Last mile





# THE FUTURE OF LAST MILE LOGISTICS: FOUR KEY URBAN E-COMMERCE TRENDS



## 3. Localized delivery networks

Delivery networks are becoming more localized, shifting their supply chain to focus more on regional fulfilment strategies with the aim of shortening the last mile.

## 1. Flexi delivery solutions

Customers increasingly expect to select when, where, and how parcels are delivered. Developing flexi-delivery solutions has transformed the way transport operators service the last mile.

Download white paper:  
[logistics.dhl/urban-consumer](https://logistics.dhl/urban-consumer)



## 2. Seasonal logistics

E-commerce has increasingly penetrated globally celebrated holidays, regional holidays, and commercial holidays, resulting in significant spikes in sales during these periods.



COMMERCIAL HOLIDAYS



CHRISTMAS



DIWALI



CHINESE NEW YEAR

## 4. Evolving technologies

Localization, flexi-delivery solutions, and seasonal logistics solutions have all been facilitated by innovative technologies. Logistics players are increasingly adopting AI and the use of big data analytics to work towards more flexible models.

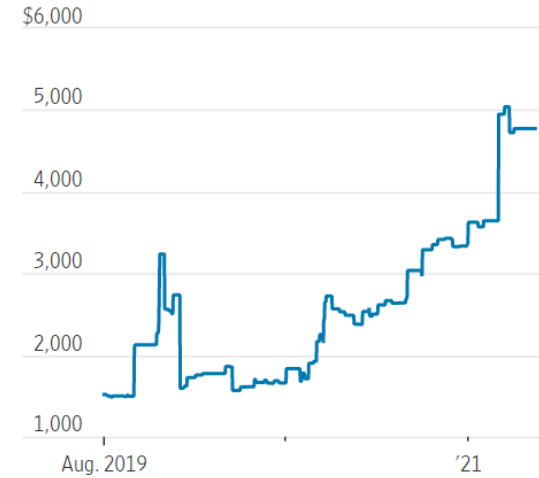


# Transportation costs in the future

- Shipping and logistics costs are expected to keep rising in 2022
- For example, due the different transport reduction measures and regulations the cost of transportation will be increased in the future
  - Finland's remoteness and long transport distances to the main markets mean that transport emission reduction measures affect Finland's foreign trade competitiveness more than competitor countries'
  - Finland should take particular care that the competitiveness of business will also be safeguarded in the future

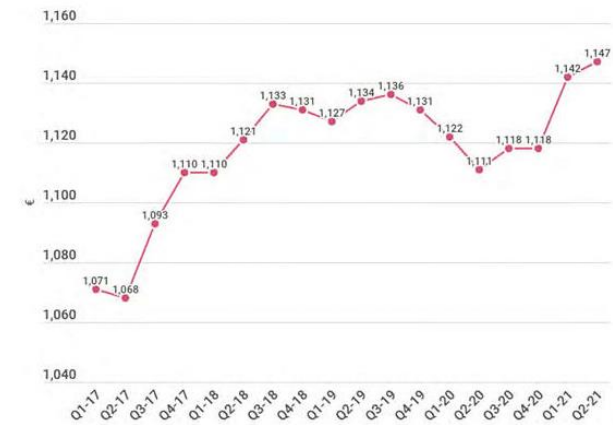
## Raising Rates

Average price for shipping a 40-foot ocean container from Shanghai to Los Angeles under long-term contracts, 2019 - 2021



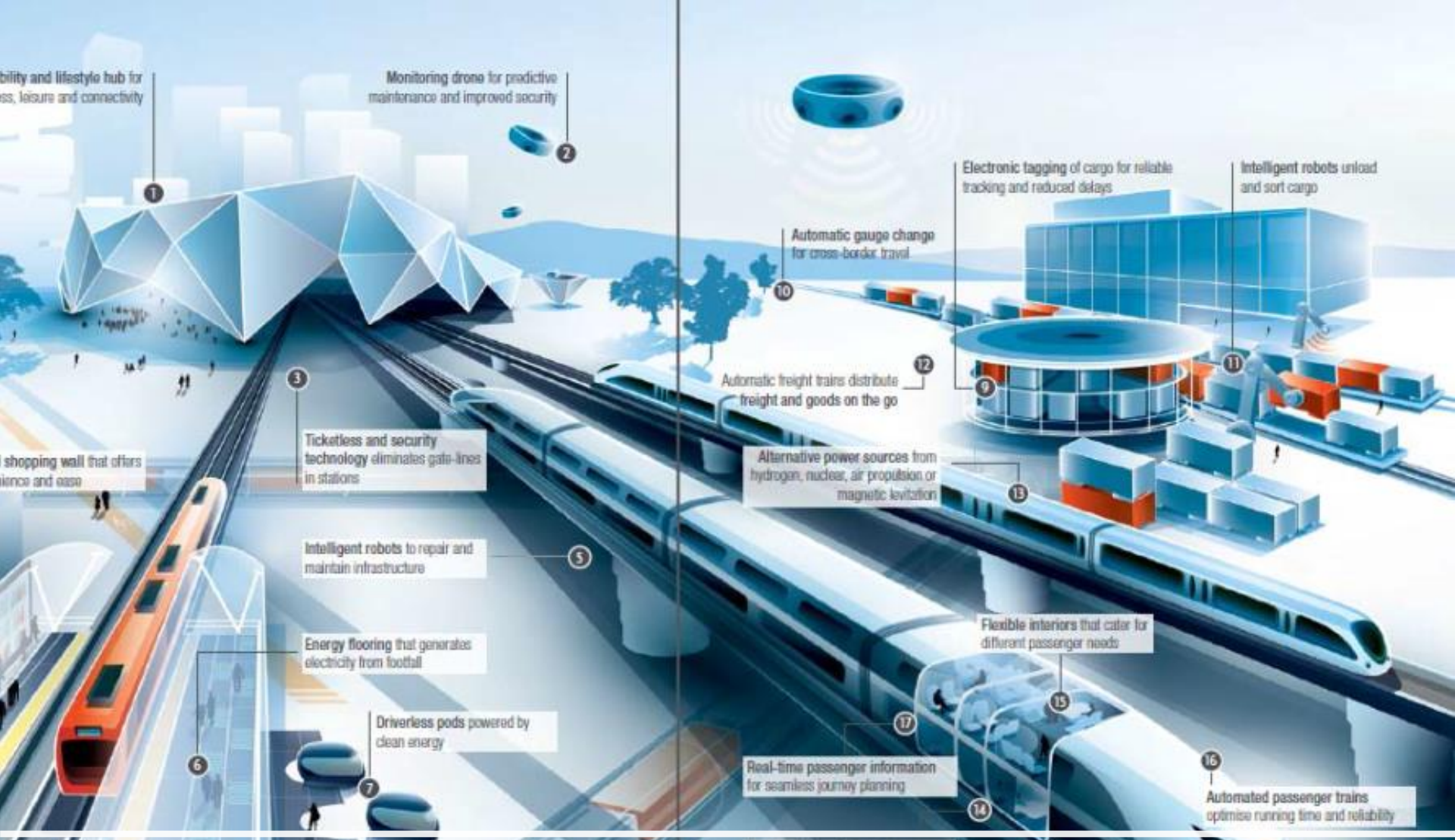
Source: Xeneta

Ti & Uply European Road Freight Benchmark – Average European Road Freight Rates, Q2-2021





## The future transportation system - visio



ability and lifestyle hub for  
work, leisure and connectivity

Monitoring drone for predictive  
maintenance and improved security

shopping wall that offers  
entertainment and ease

Ticketless and security  
technology eliminates gate-lines  
in stations

Intelligent robots to repair and  
maintain infrastructure

Energy flooring that generates  
electricity from footfall

Driverless pods powered by  
clean energy

Automatic gauge change for  
cross-border travel

Automatic freight trains distribute  
freight and goods on the go

Alternative power sources from  
hydrogen, nuclear, air propulsion or  
magnetic levitation

Electronic tagging of cargo for reliable  
tracking and reduced delays

Intelligent robots unload  
and sort cargo

Flexible interiors that cater for  
different passenger needs

Real-time passenger information  
for seamless journey planning

Automated passenger trains  
optimise running time and reliability

Smart window glazing that  
automatically controls heat and glare

Underground freight pipelines for  
moving goods in cities

# The future transportation system - visio



# What is needed to develop competitive logistics systems for the future business environment?

- **Strategic level thinking and open innovation**
  - Visionary approaches
  - Strategic agility
  - Capability for (fast) implementation
- **Conceptual approaches**
  - Crossing traditional boundaries
  - Common target settings in both company business and public sectors
  - For example, different green society concepts and ecosystems
- **Change in the whole way of thinking**
  - Through the entire organisation
- **Proactivity**
  - Increasing capability to adapt for changing conditions and business environment



# Thank you!

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