International Transport Forum

Global dialogue for better transport

Decarbonising Road Freight

Results of expert opinion survey

Francisco Furtado, ITF-OECD

28 June 2018

OECD

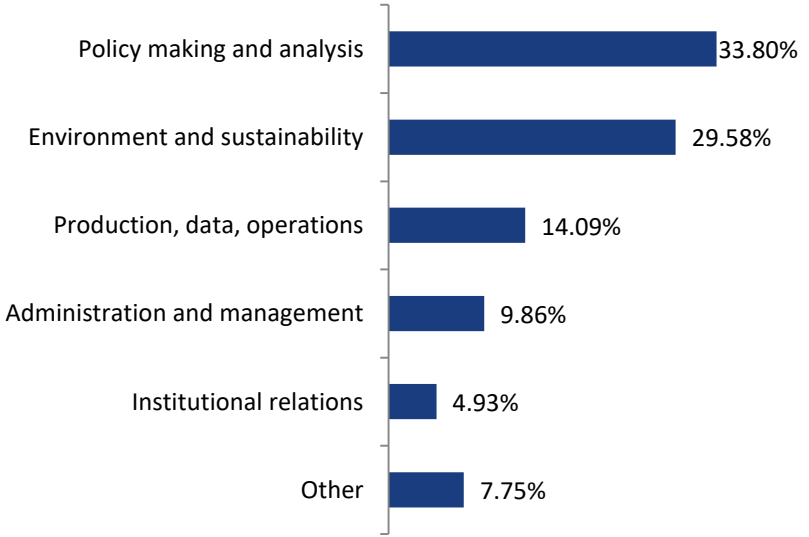
INTRODUCTION

- **The expert survey is part of the ITF Decarbonising Transport initiative's thematic work stream on Road Freight transport, aiming to**
  - Gather initial evidence on cost-effectiveness, market uptake and barriers to implement different measures
    - Logistics and supply chains
    - Alternative Fuels
    - Vehicle and engine efficiency
    - Intelligent systems and driver training
  - Explore how emerging market trends, new entrants and disruptive technologies might shape the sector
  - Identify pressing challenges and policy priorities

INTRODUCTION

- **The survey was sent to experts in government, industry, civil society and academia.**
  - 108 experts responded
  - 80% of respondents European based,
    20% are non-European based
  - 30% government
    28% private sector
    25% research/academia
    18% international organisations or NGOs

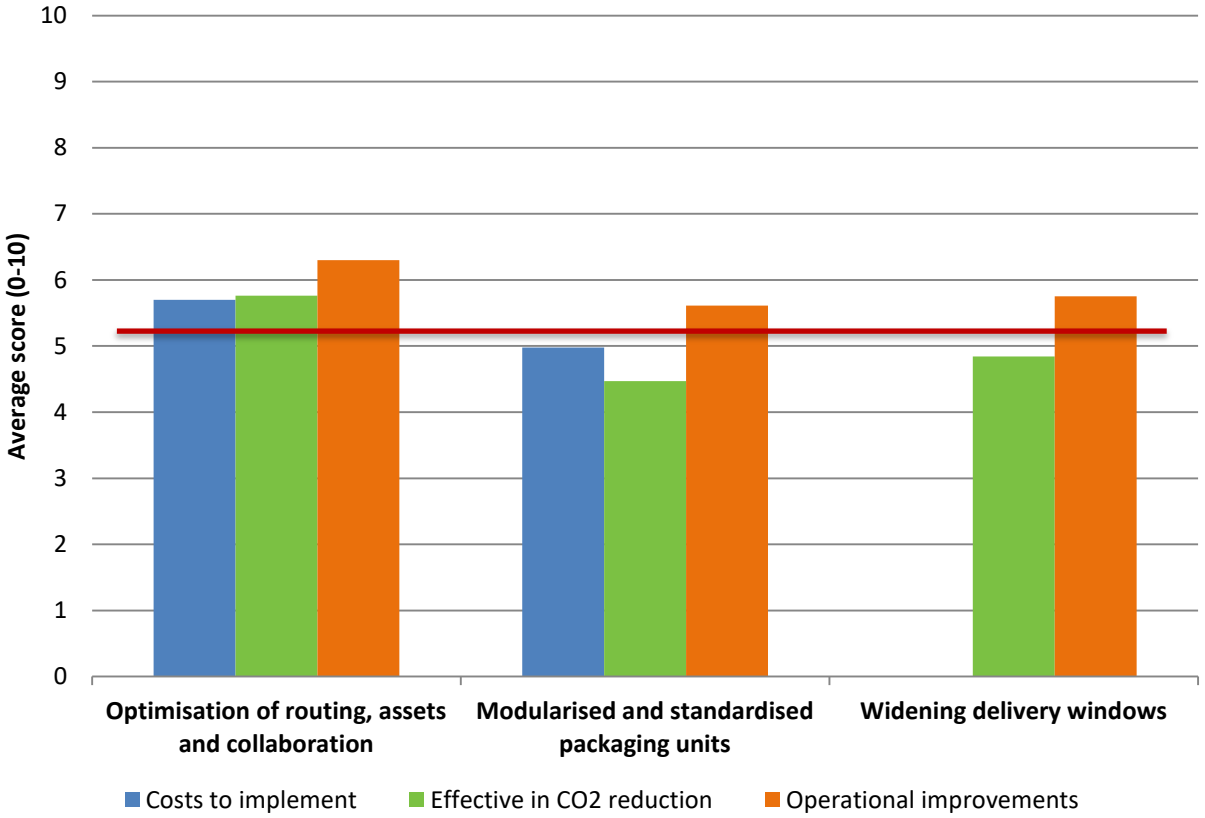
In which area do you work?



International Transport Forum

Logistics and supply chains

COST-EFFECTIVENESS



- **Optimisation and collaboration most effective logistics measure reducing emissions (above overall average)**
- **All logistic measures have more impacts on operational improvements than for reducing emissions**

BARRIERS

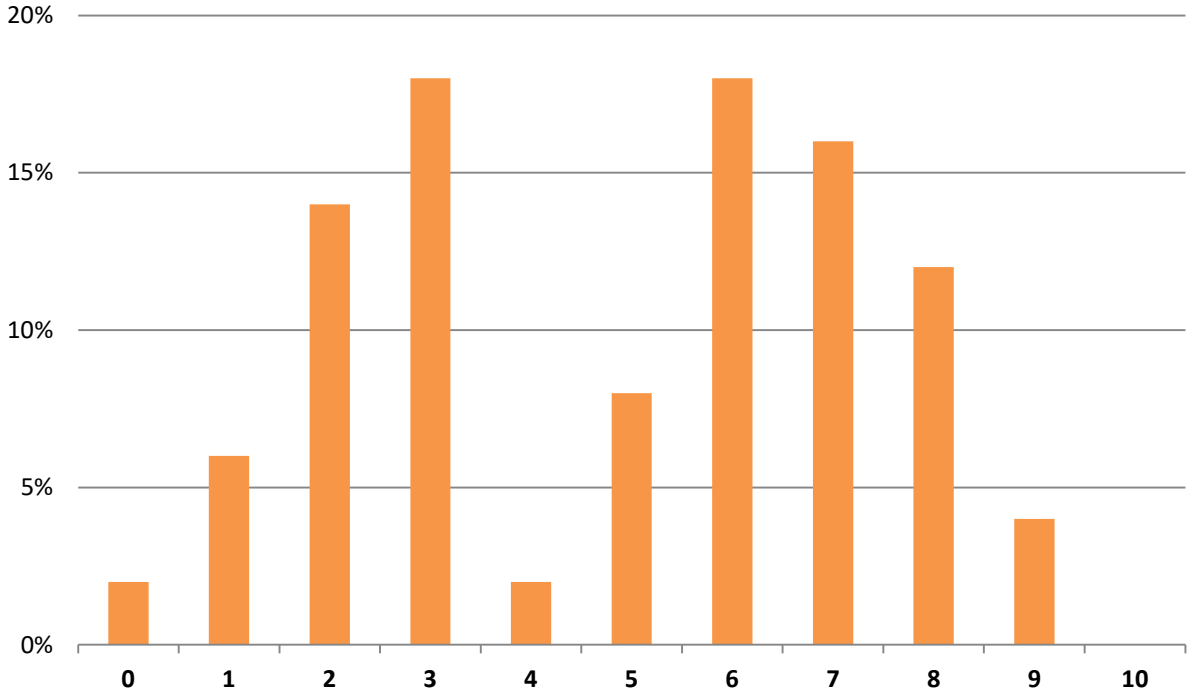
	Optimisation and Collaboration	Modular packaging units	Widening delivery windows
1	Industry-level coordination and cooperation	Industry-level coordination and cooperation	Goes against market trends
2	Market structure and lack of scale at individual company level	Market structure and competitive pressure	Permits, standards and regulations
3	Cultural barriers in the industry	Vehicle design	Cultural barriers in the industry/Lack of government support and incentives

- ❑ Industry level coordination and market structure are the major barriers for Optimisation and Modular units.
- ❑ Market trends and existing permits/regulations are the key barriers to widening the delivery windows.

If delivery windows are not relaxed it is impossible to increase vehicle capacity utilisation (even when other measures are deployed)?

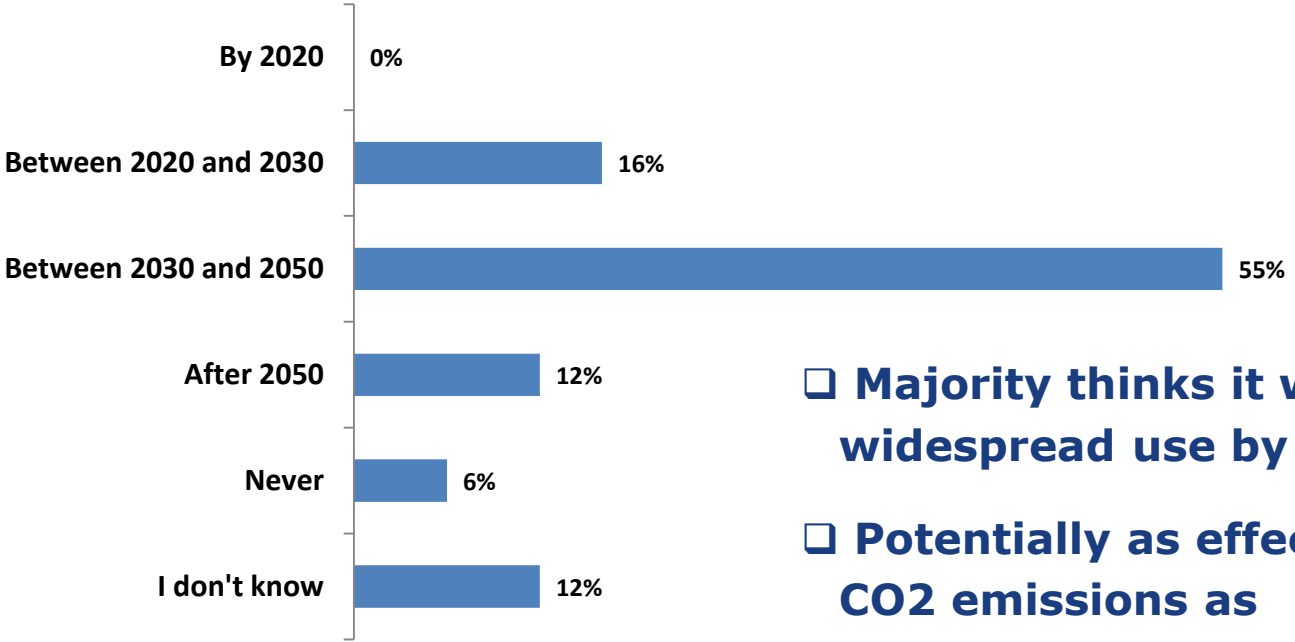
Strongly disagree

Strongly agree



- **Beyond the average score a picture of divided opinions**

❑ When do you think "The Physical Internet" will be in widespread use?



- ❑ Majority thinks it will be in widespread use by 2050
- ❑ Potentially as effective in decreasing CO2 emissions as Optimisation/Collaboration

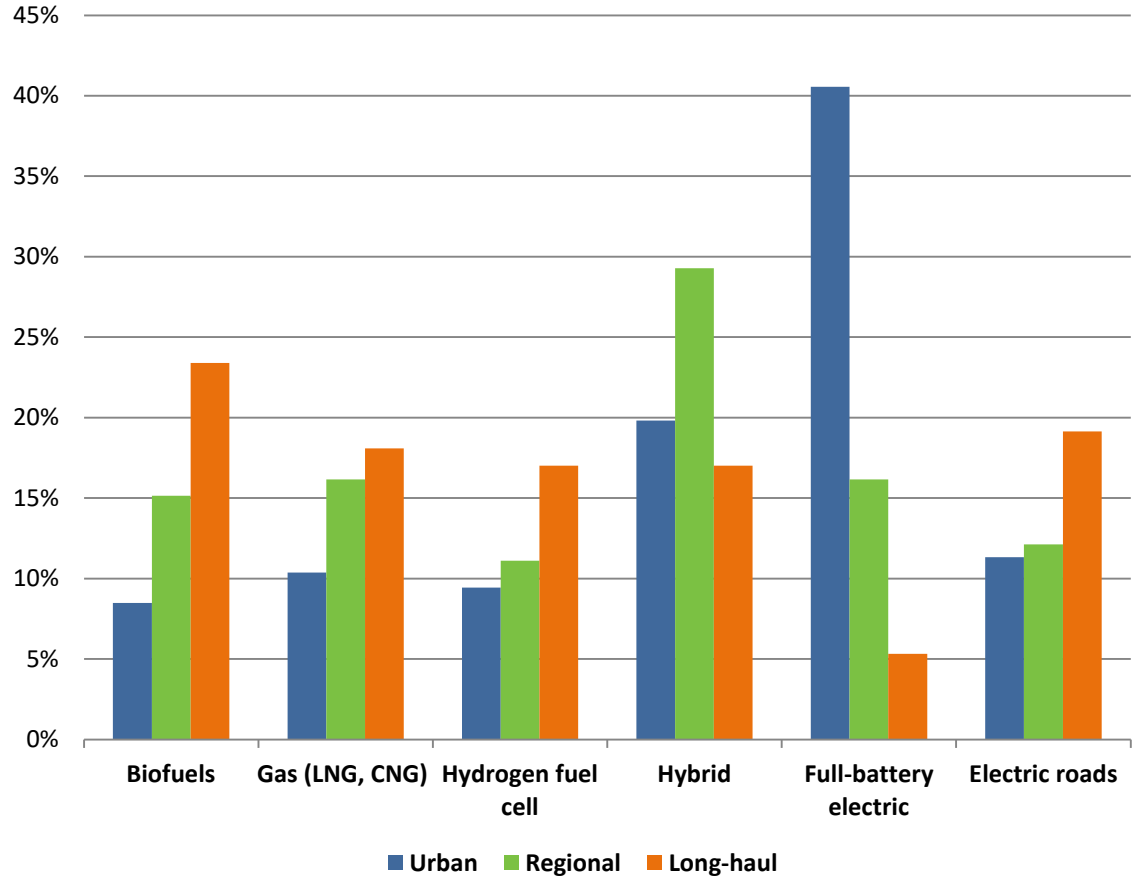
International Transport Forum

Alternative Fuels

International Transport Forum

Alternative Fuels

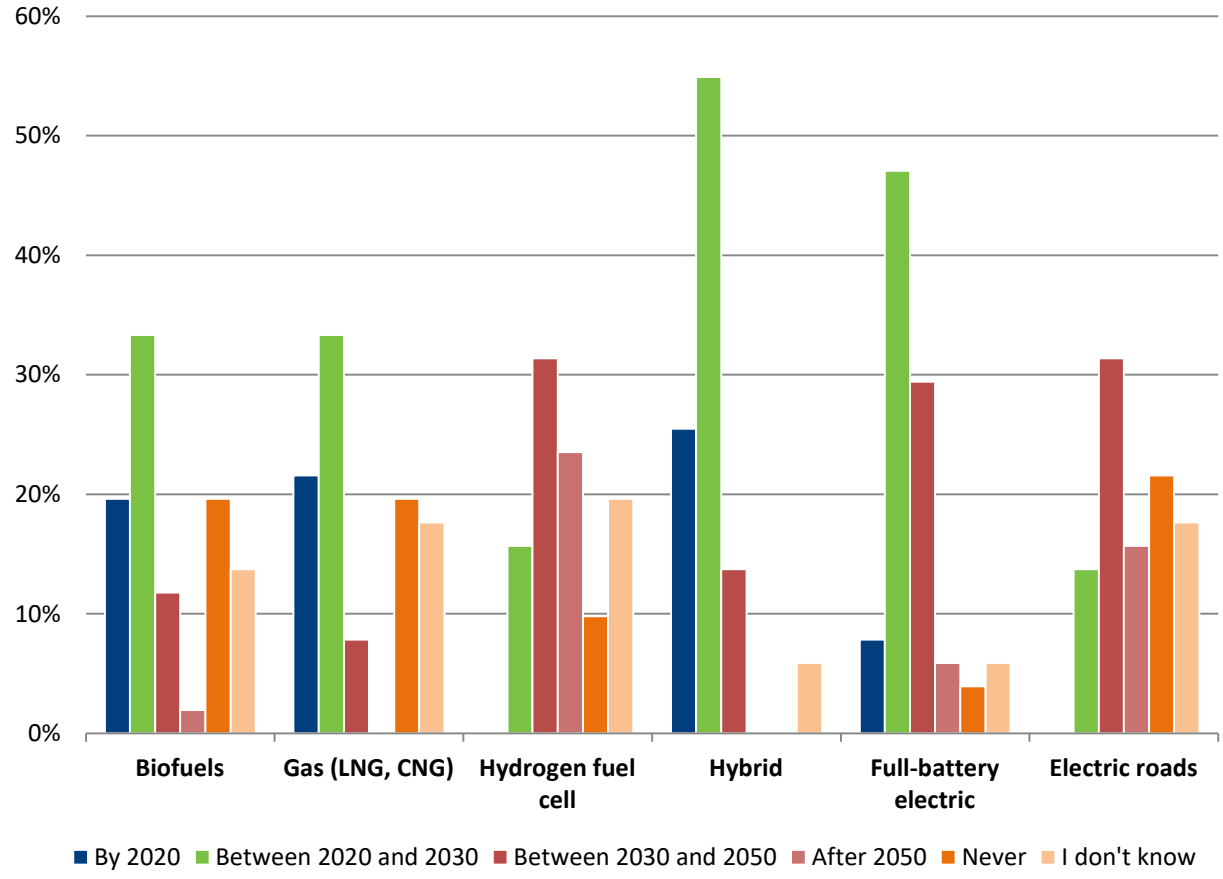
COST-EFFECTIVENESS



- **Different alternative mix for different operation types**
  - Full-battery electric (2nd Hybrid) for *Urban*
  - Hybrid (2nd Gas/Full-battery) for *Regional*
  - Biofuels (2nd Electric road) for *Long-haul*

International Transport Forum

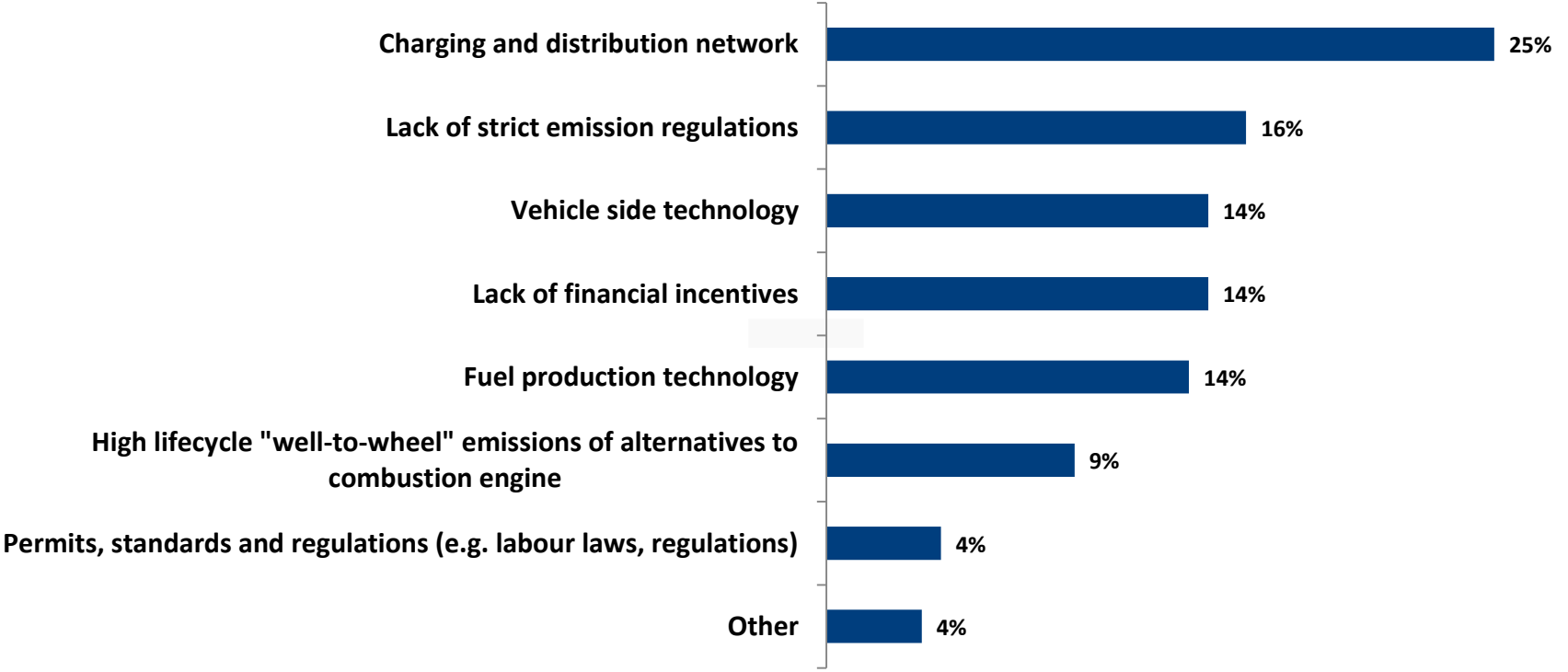
Alternative Fuels



TIMELINE

- ❑ **Hybrid fastest adoption**
- ❑ **>50% think Full-battery Electric in widespread use by 2030**
- ❑ **Gas and Biofuels, >50% also think they will be in widespread use by 2030, but higher skepticism**
- ❑ **Hydrogen and Electric roads latest adoption and highest skepticism**

BARRIERS

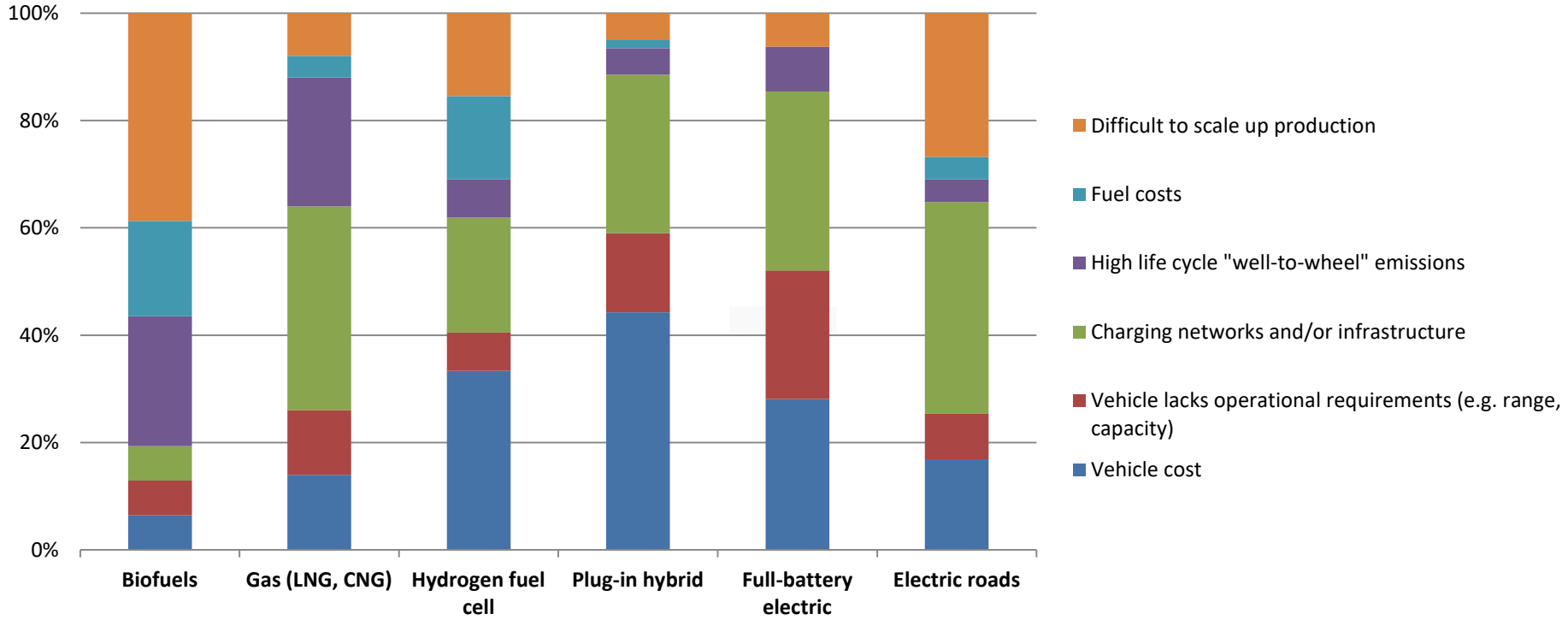


❑ **Key overall barrier is "charging and distribution network"**

International Transport Forum

Alternative Fuels

BARRIERS



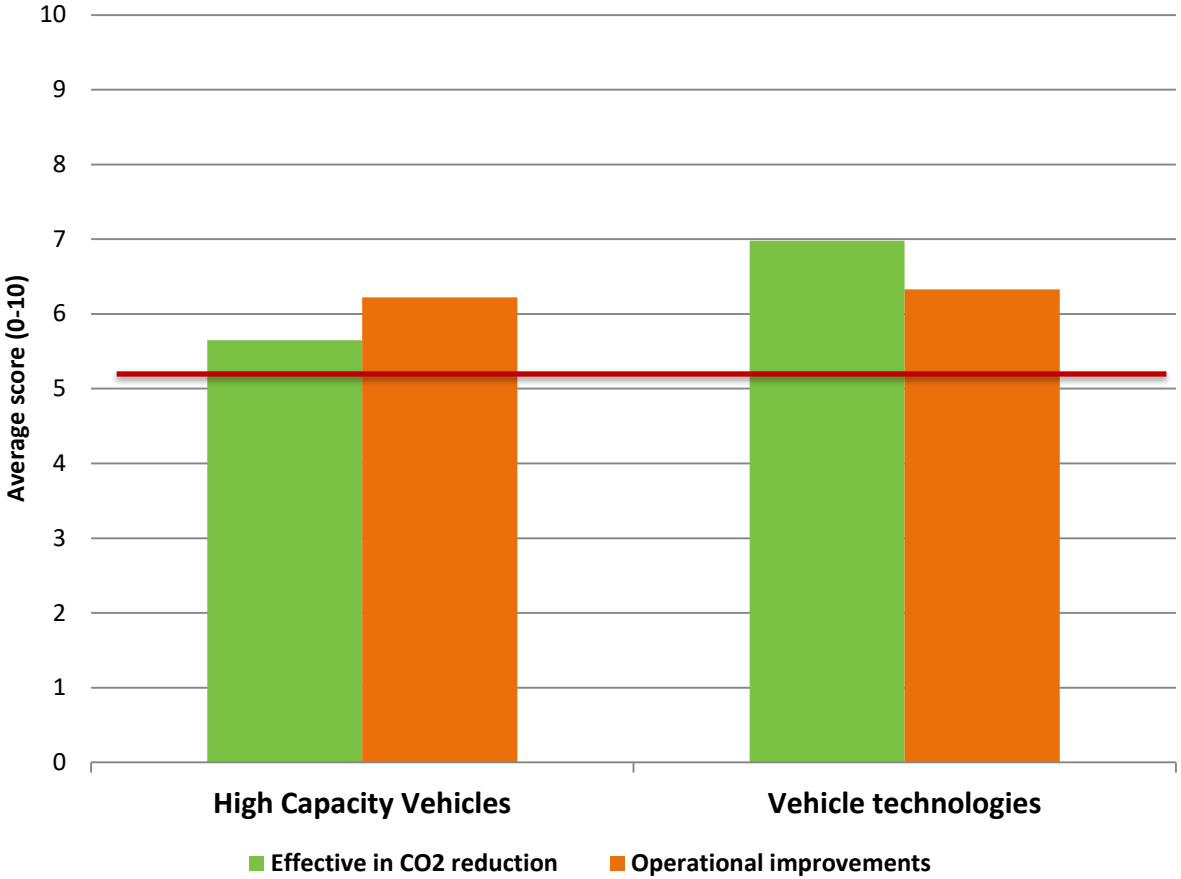
- For Biofuels key barrier is the difficulty to scale up production, vehicle costs for Hybrids

International Transport Forum

Vehicle and engine efficiency

International Transport Forum

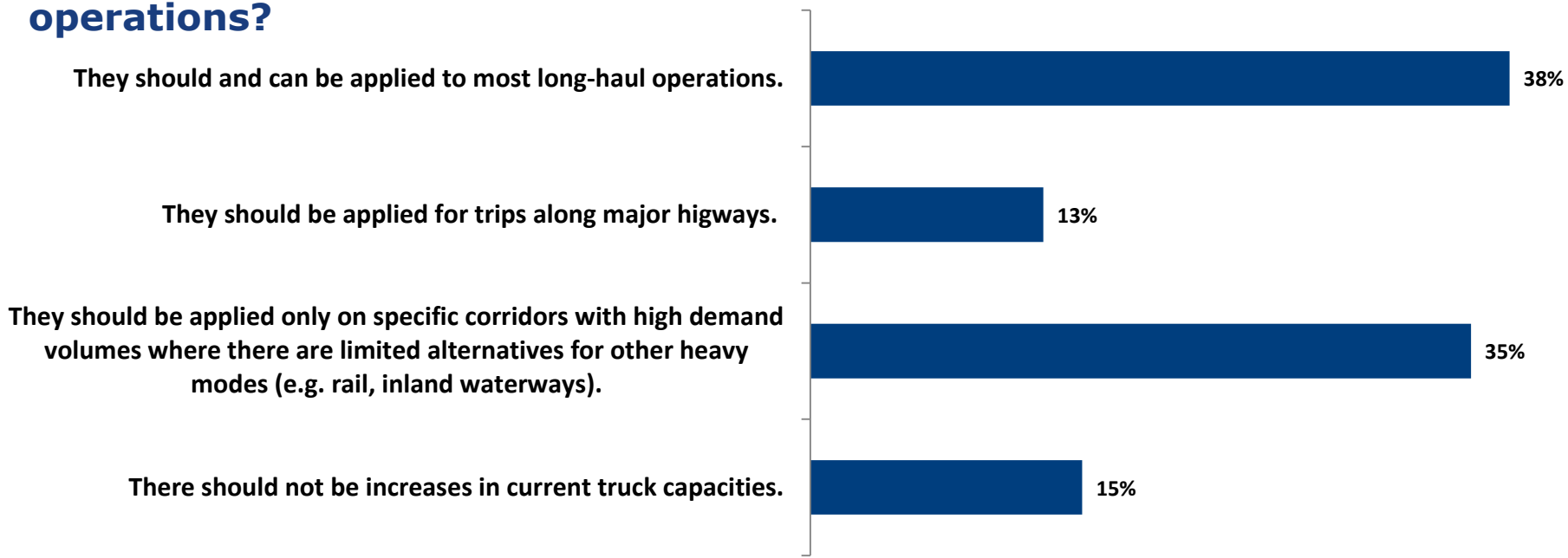
Vehicle and engine efficiency COST-EFFECTIVENESS



- Improving efficiency of vehicles (engine, rolling resistance, aerodynamics etc.) is the most effective CO2 reducing measure (not including alternative fuels)

- High Capacity Vehicles more impacts on operational improvements than CO2 reduction

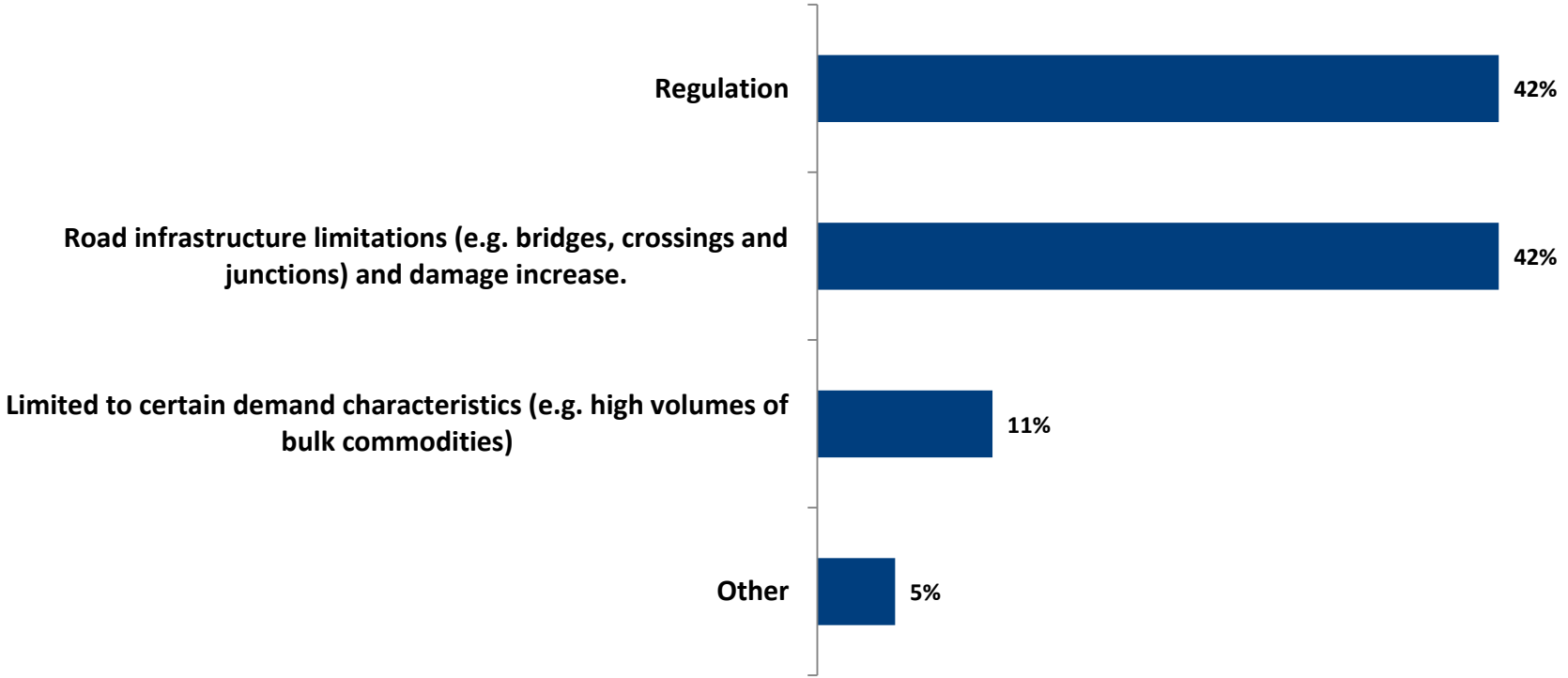
To what extent should high capacity vehicles be deployed for long-haul operations?



- 85% of the respondents think it should be applied (with more or less restrictions)
- But around half put high restrictions (or completely object)

Vehicle and engine efficiency

BARRIERS



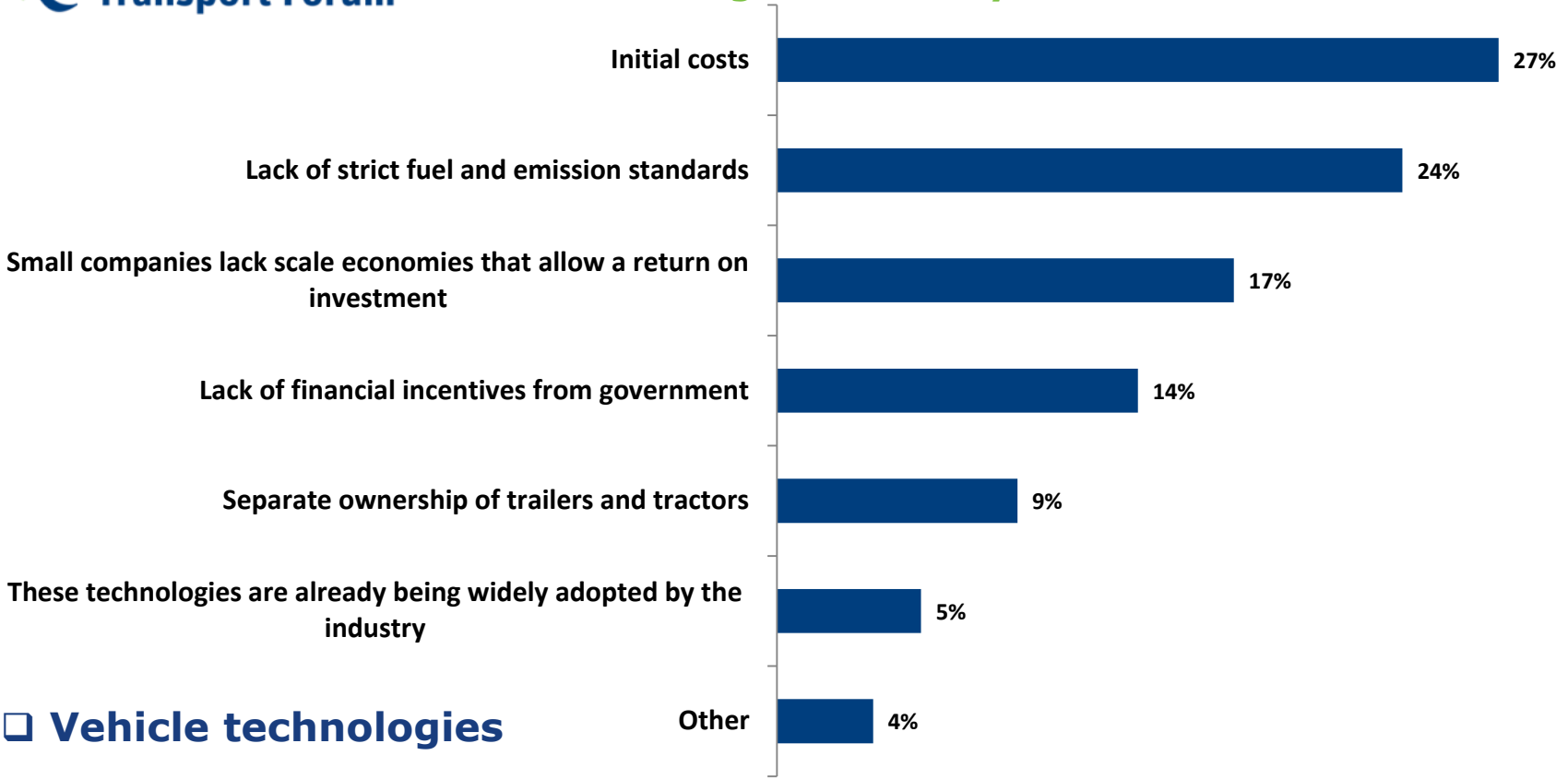
❑High Capacity Vehicles

- Regulation and Infrastructure limitations

International Transport Forum

Vehicle and engine efficiency

BARRIERS



❑ Vehicle technologies

- Initial costs, lack of strict fuel and emissions standards

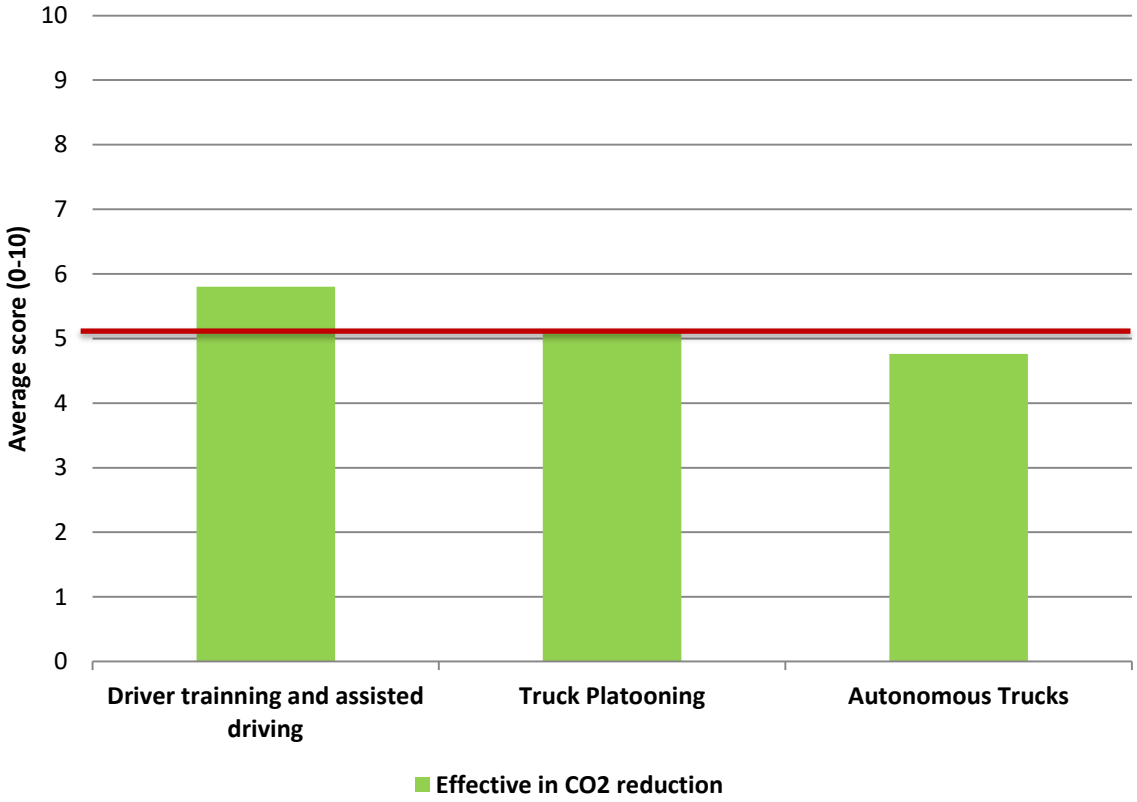
International Transport Forum

Intelligent systems and driver training

International Transport Forum

IS and driver training

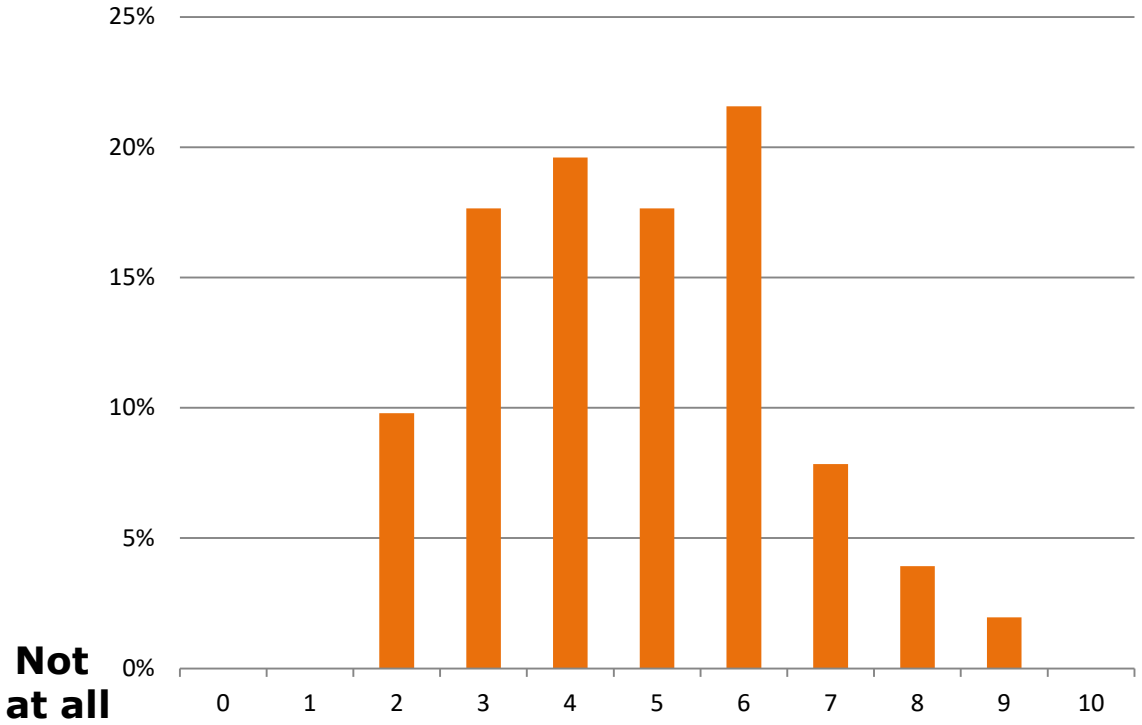
EFFECTIVENESS



- Driver training the most effective in decreasing CO2 emissions in this group (above overall average).
- Truck platooning on the average, Autonomous Trucks below.

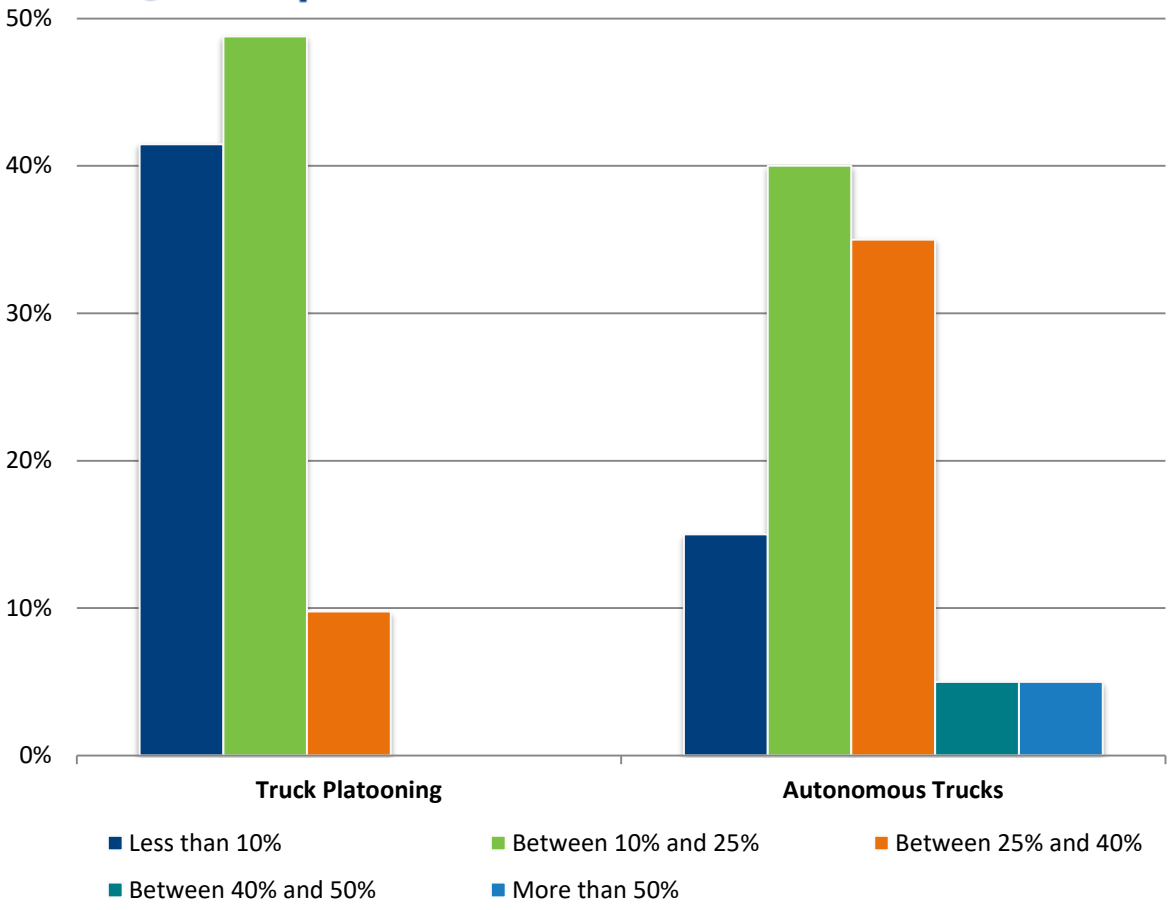
To what extent are driver training and assisted driving currently employed across the industry?

- Average score 4.73, still room to grow



International Transport Forum

IS and driver training



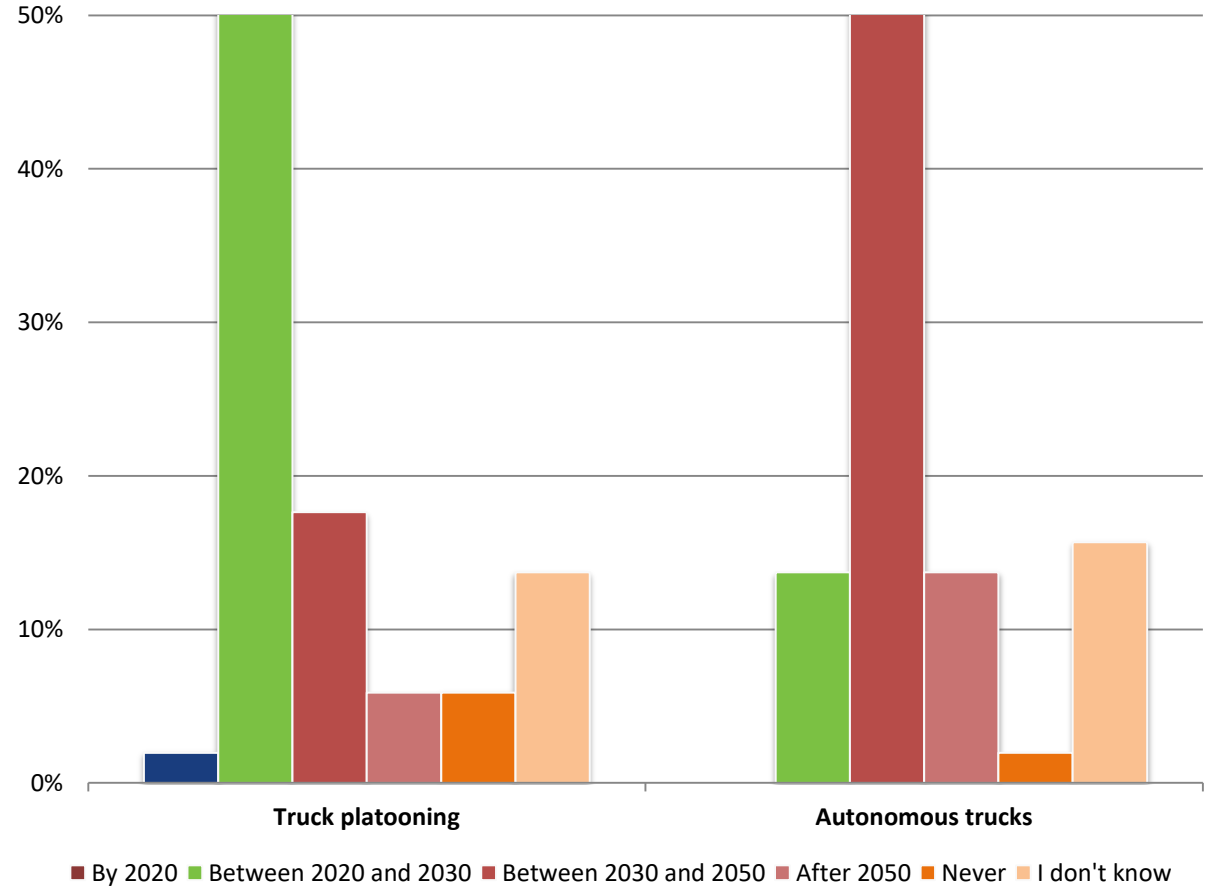
OPERATIONAL COSTS

- ❑ >50% think Truck platooning will deliver operational cost decreases of more than 10%
- ❑ 45% think Autonomous trucks will deliver operational cost decreases of more than 25%

International Transport Forum

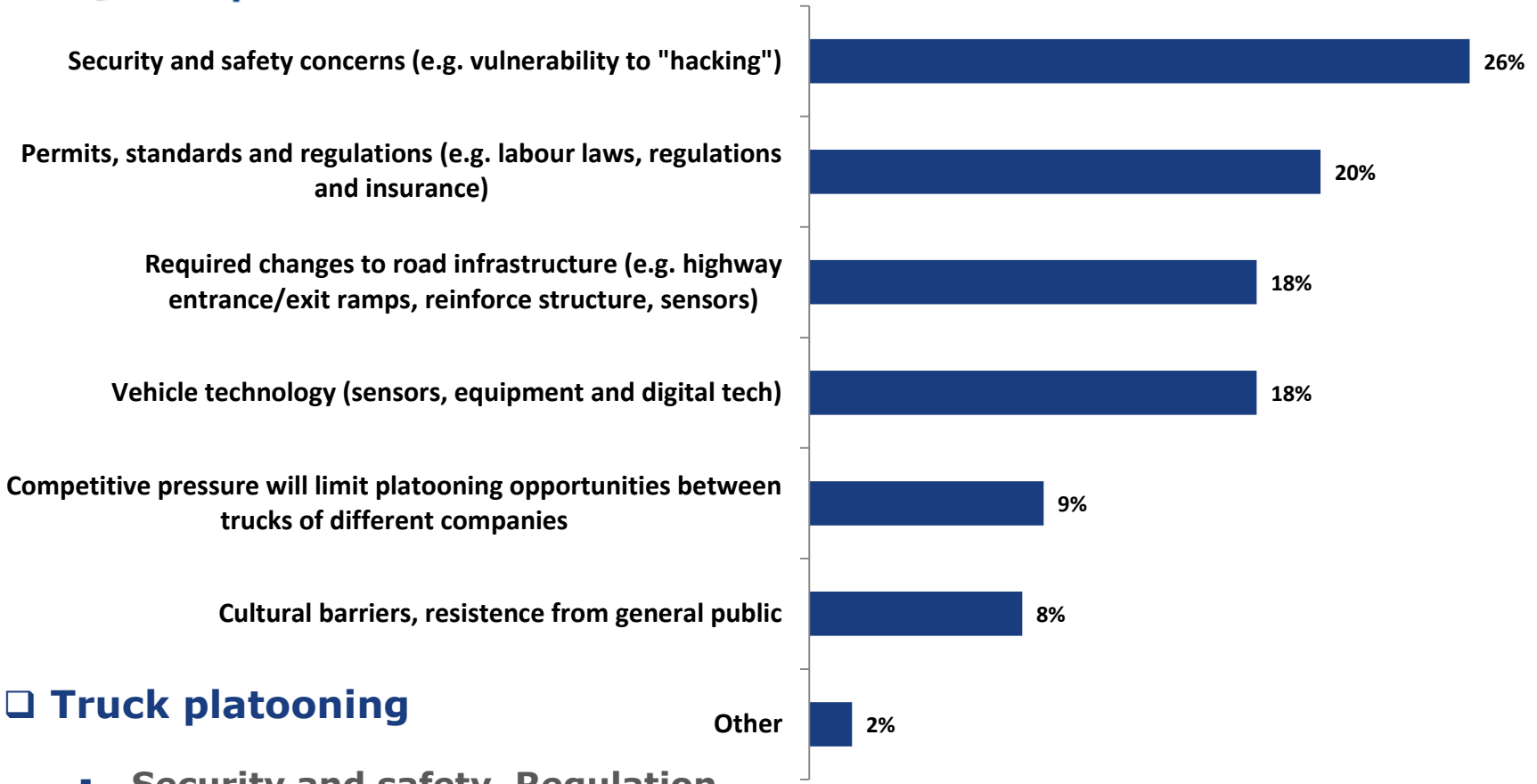
IS and driver training

TIMELINE



- ❑ >50% stated Truck platooning will be a common practice by 2030
- ❑ >50% stated Autonomous Trucks will be in general use by 2050

BARRIERS



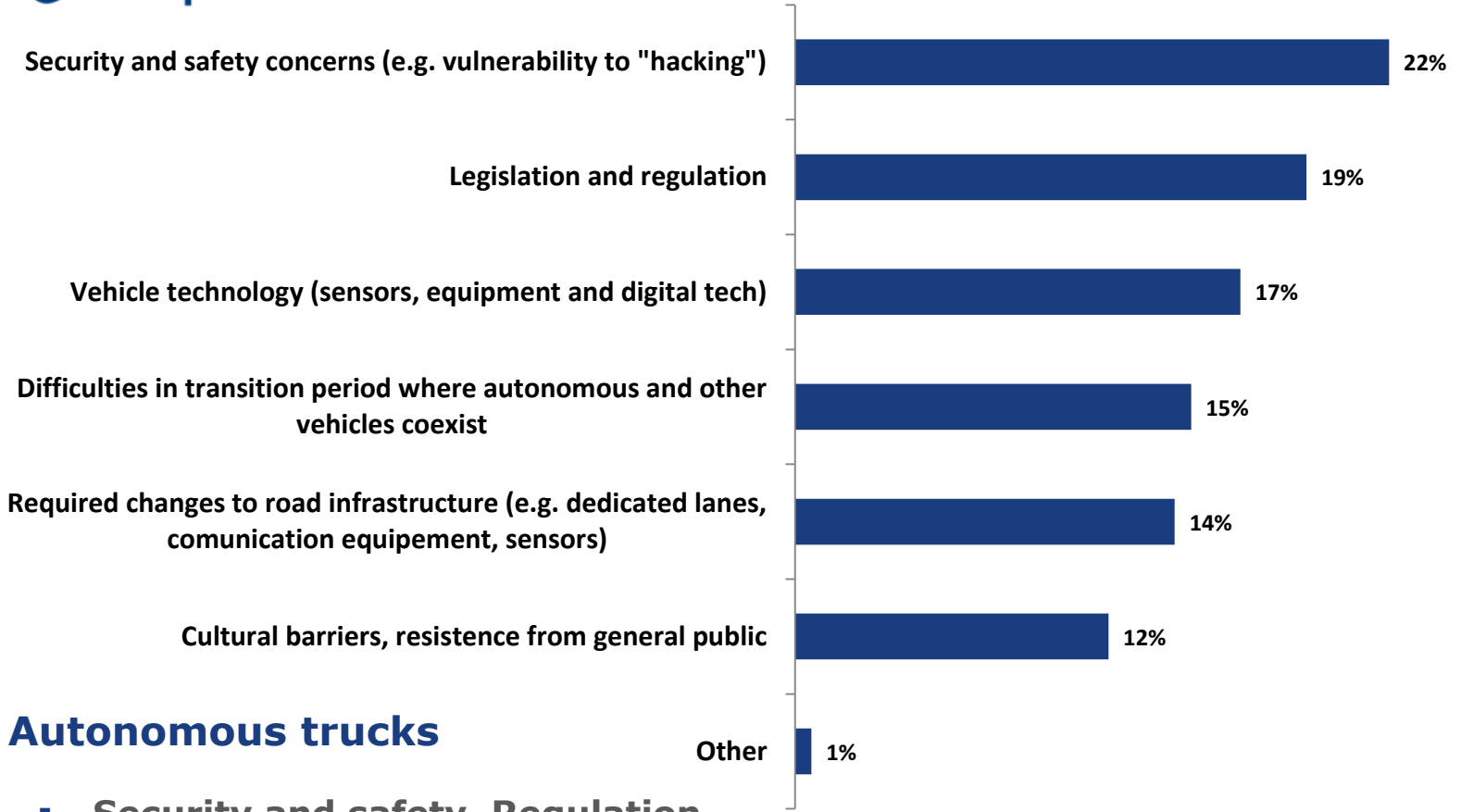
❑ Truck platooning

- Security and safety, Regulation

International Transport Forum

IS and driver training

BARRIERS

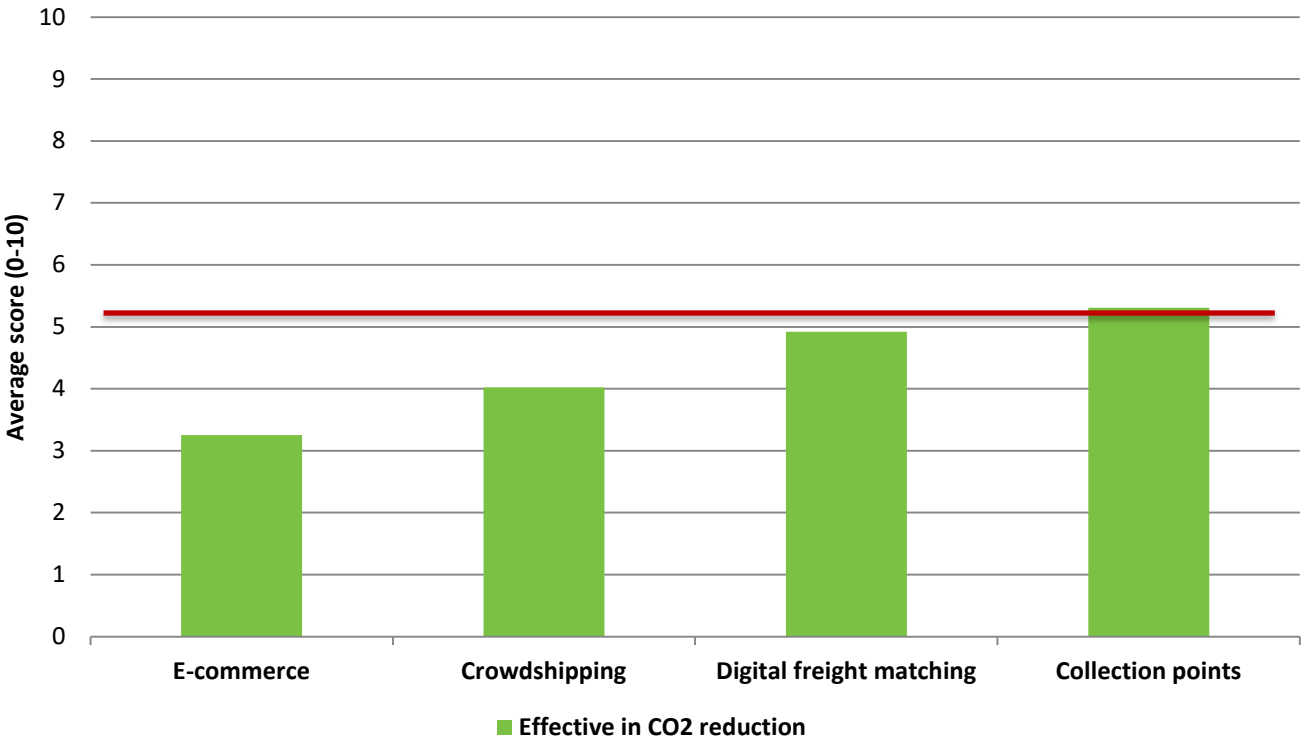


- **Autonomous trucks**
  - **Security and safety, Regulation**

International Transport Forum

Emerging Trends

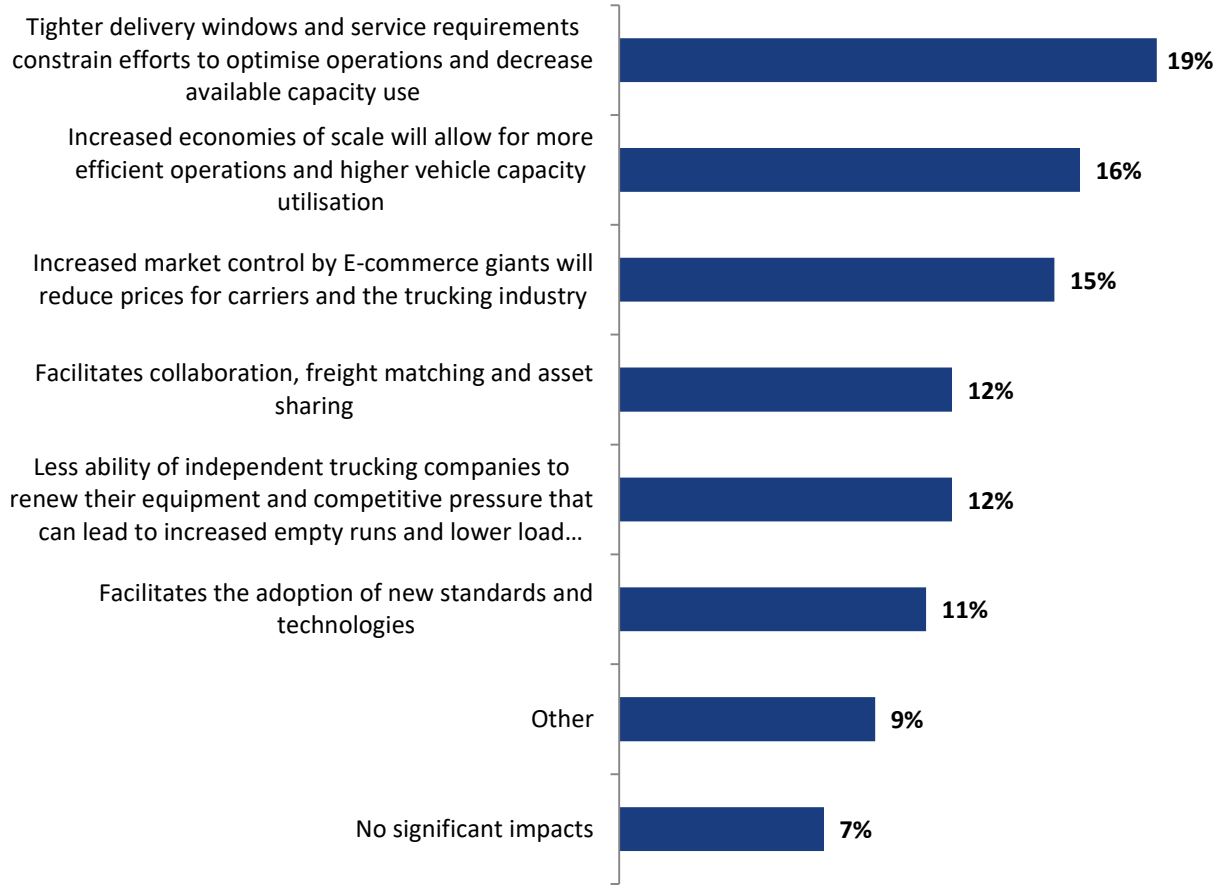
EFFECTIVENESS



- E-commerce is the least effective CO2 reduction measure/trend, Crowdshipping is second worst overall

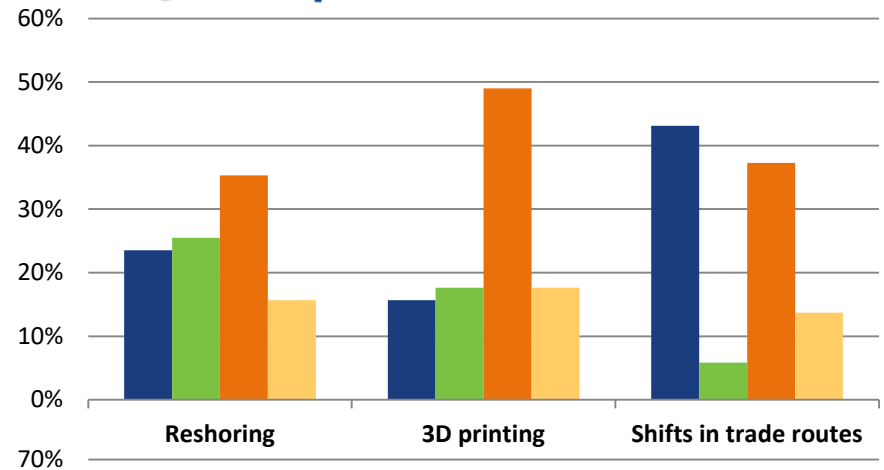
- Collection points slightly above overall average

E-COMMERCE MOST RELEVANT IMPACTS



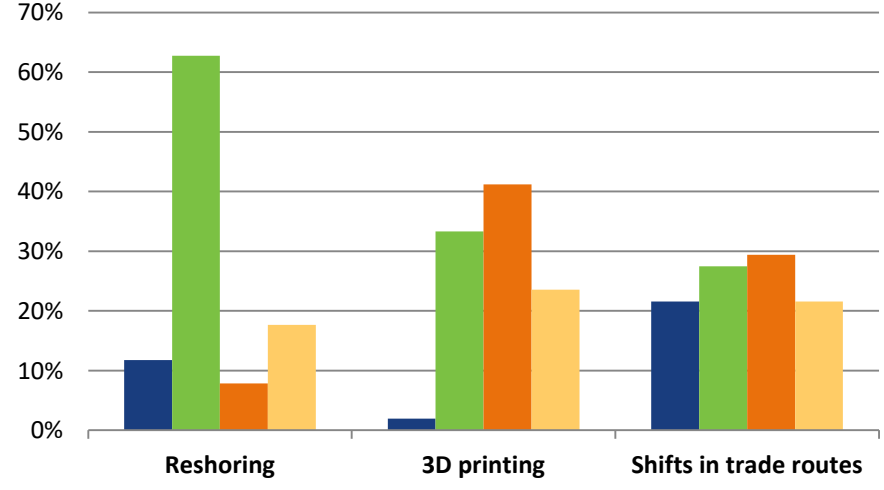
- ❑ **Increased service requirements that constrain efforts to Optimise**
- ❑ **61% stated they could significantly reduce private trips for shopping**
- ❑ **E-commerce companies will increasingly play a dominant role as logistic services providers**

International Transport Forum



Demand

- Increase
- Decrease
- Not significant
- I don't know



Distances

- Increase
- Decrease
- Not significant
- I don't know

EXOGENOUS FACTORS

❑ Reshoring

- No consensus on demand
- Decreased distances

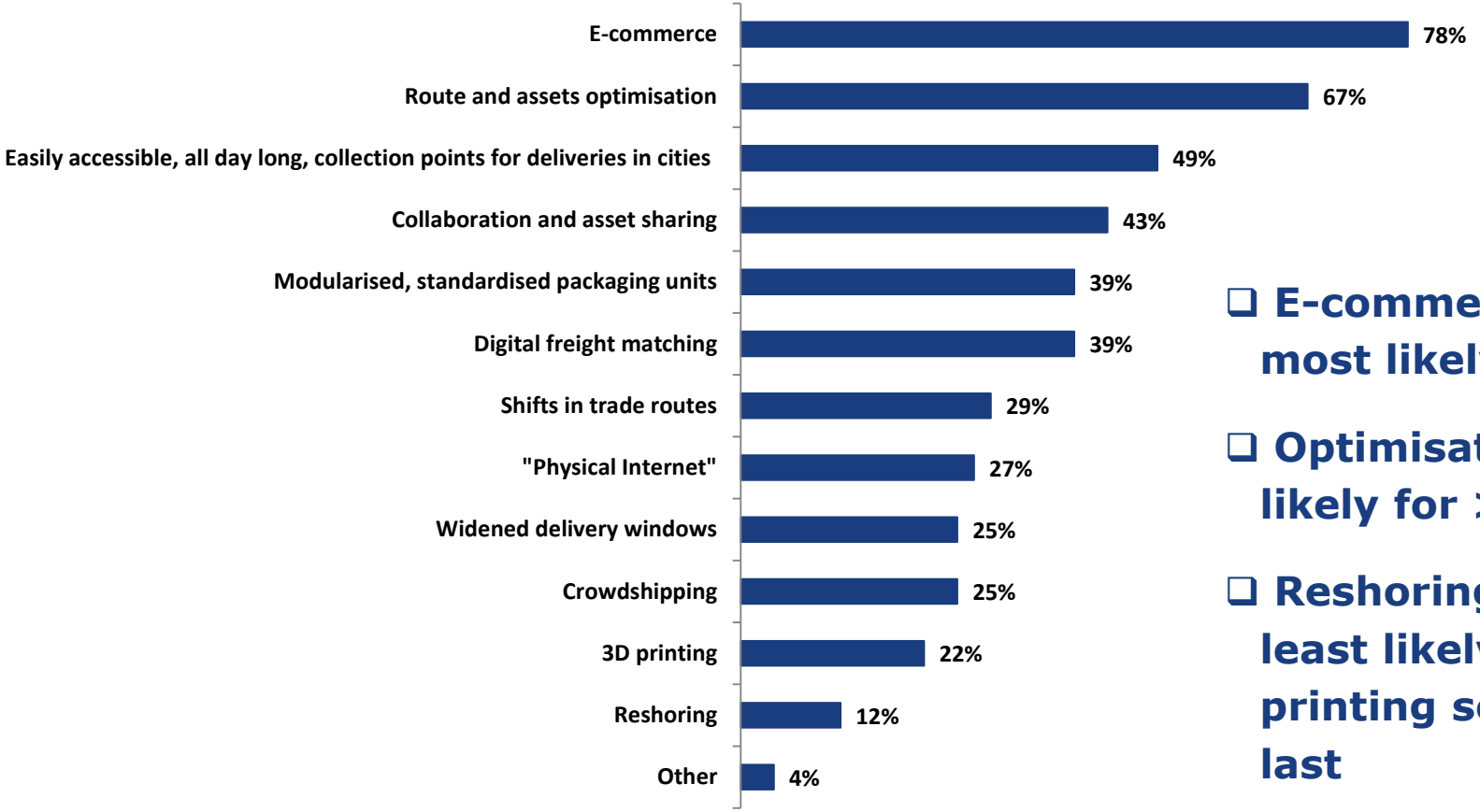
❑ 3D printing

- Not significant on demand
- Not significant or decreased distance

❑ Shifts in trade routes

- Increased demand
- No consensus on distance

MOST LIKELY TRENDS AND LOGISTIC MEASURES BY 2030



- ❑ **E-commerce is the most likely trend**
- ❑ **Optimisation is also likely for >50%**
- ❑ **Reshoring is the least likely, 3D printing second to last**

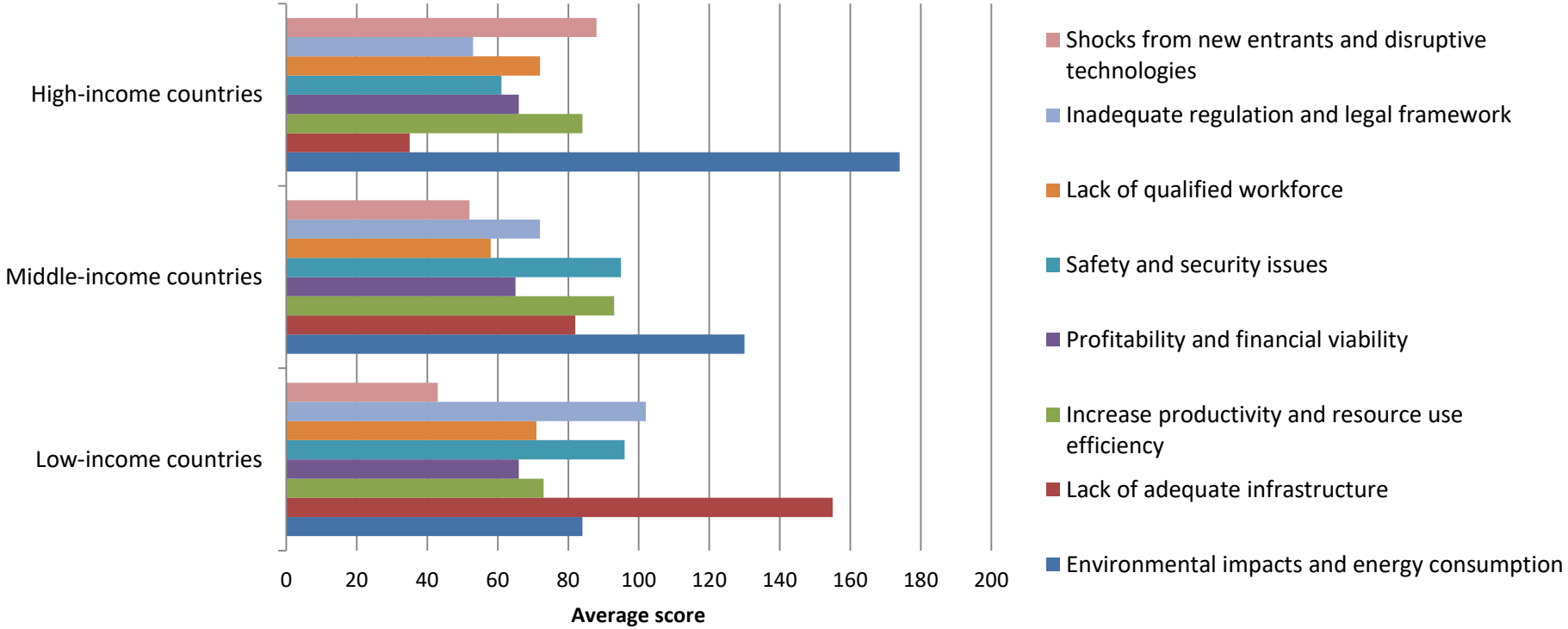
International Transport Forum

Pressing challenges, policy priorities and who will lead transformation?

International Transport Forum

PRESSING CHALLENGES

❑Different pressing challenges by level of economic development



International Transport Forum

PRESSING CHALLENGES

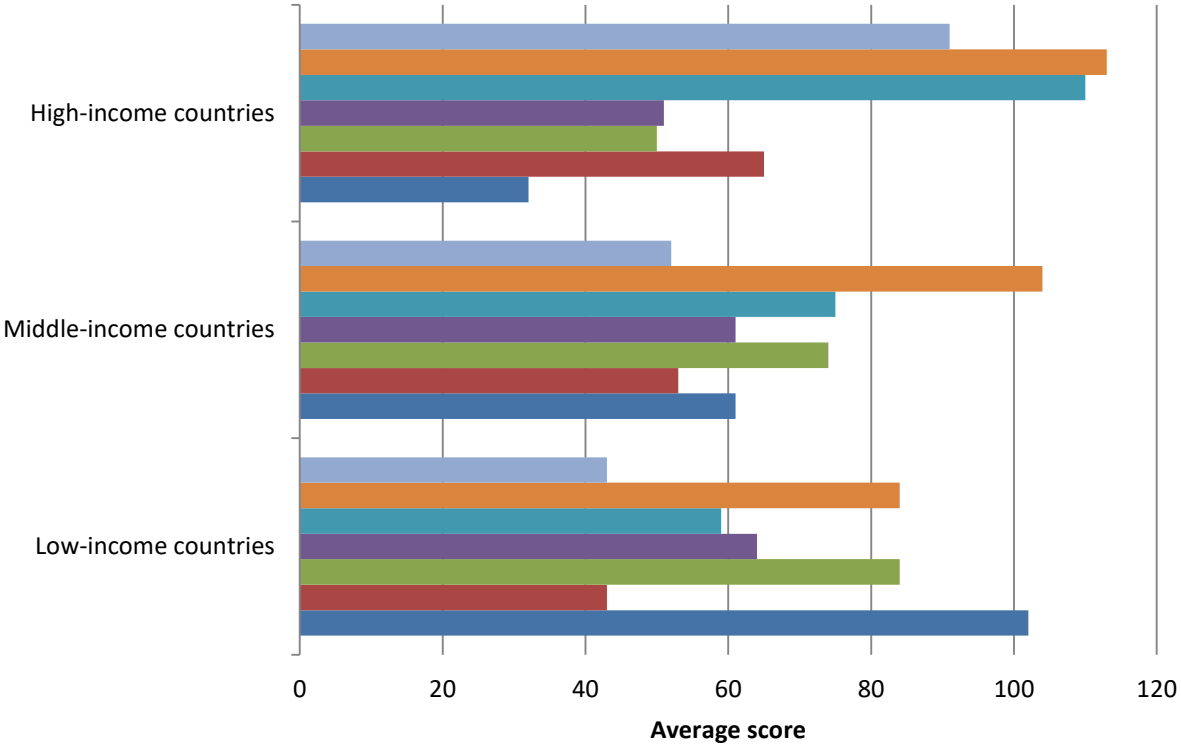
	Low-income	Middle-income	High-income
1	Lack of adequate infrastructure	Environmental impacts and energy consumption	Environmental impacts and energy consumption
2	Inadequate regulation and legal framework	Safety and security issues	Shocks from new entrants and disruptive technologies
3	Safety and security issues	Increase productivity and resource use efficiency	Increase productivity and resource use efficiency

- Environmental issues are the most pressing challenges in middle- and high-income countries, lack of infrastructure in low-income countries
- Shocks from new entrants and disruptive technologies are an important challenge in High-income countries, Safety and security in middle income and inadequate regulation in low income

International Transport Forum

POLICY PRIORITIES

❑Policy priorities for each country group vary



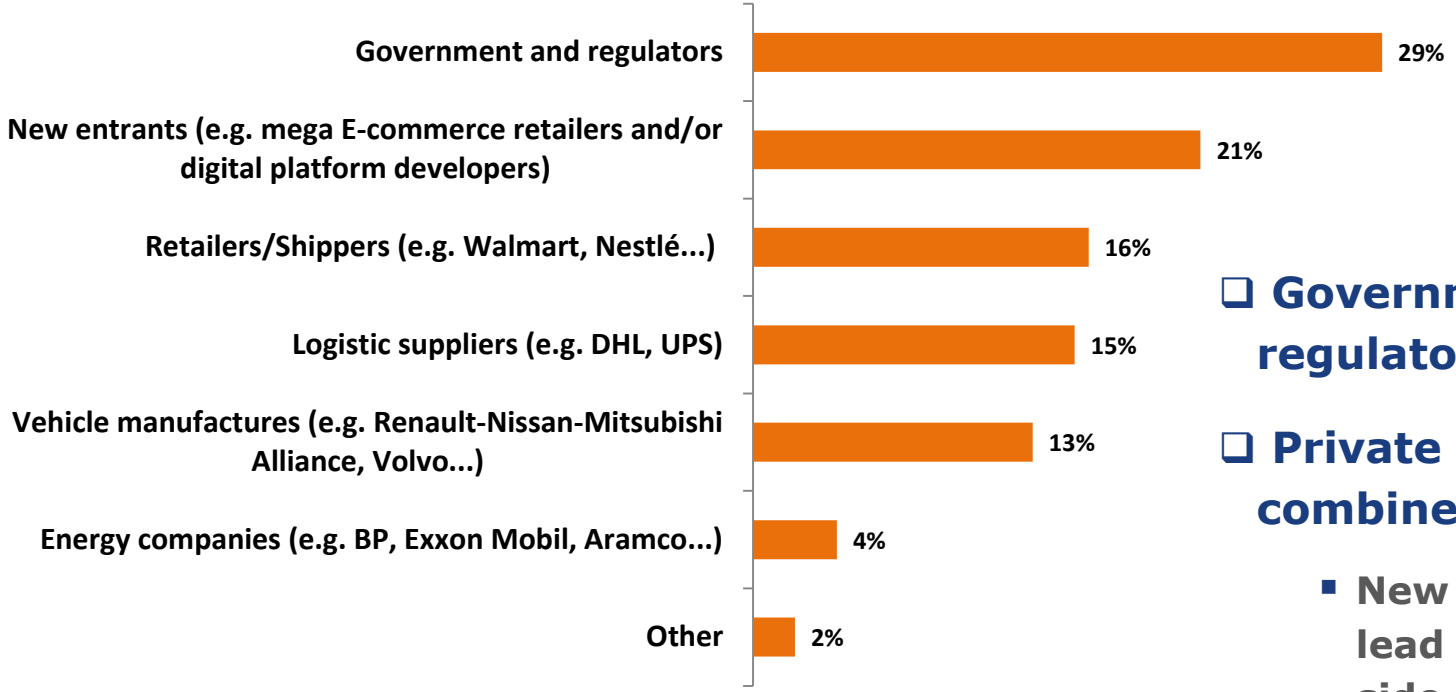
International Transport Forum

POLICY PRIORITIES

	Low-income	Middle-income	High-income
1	Improve infrastructure supply	Fuel efficiency and emissions standards for vehicles	Fuel efficiency and emissions standards for vehicles
2	Reform regulation and legal framework for the sector	Pricing mechanisms	Pricing mechanisms
3	Fuel efficiency and emissions standards for vehicles	Reform regulation and legal framework for the sector	Total or partial bans on certain vehicle types

- ❑ Fuel efficiency and emissions standards for vehicles a top priority for all countries
- ❑ Pricing mechanisms on high- and middle income countries, total or partial bans on high-income countries
- ❑ Improving infrastructure is the number one priority for low income countries

WHO WILL LEAD TRANSFORMATION?



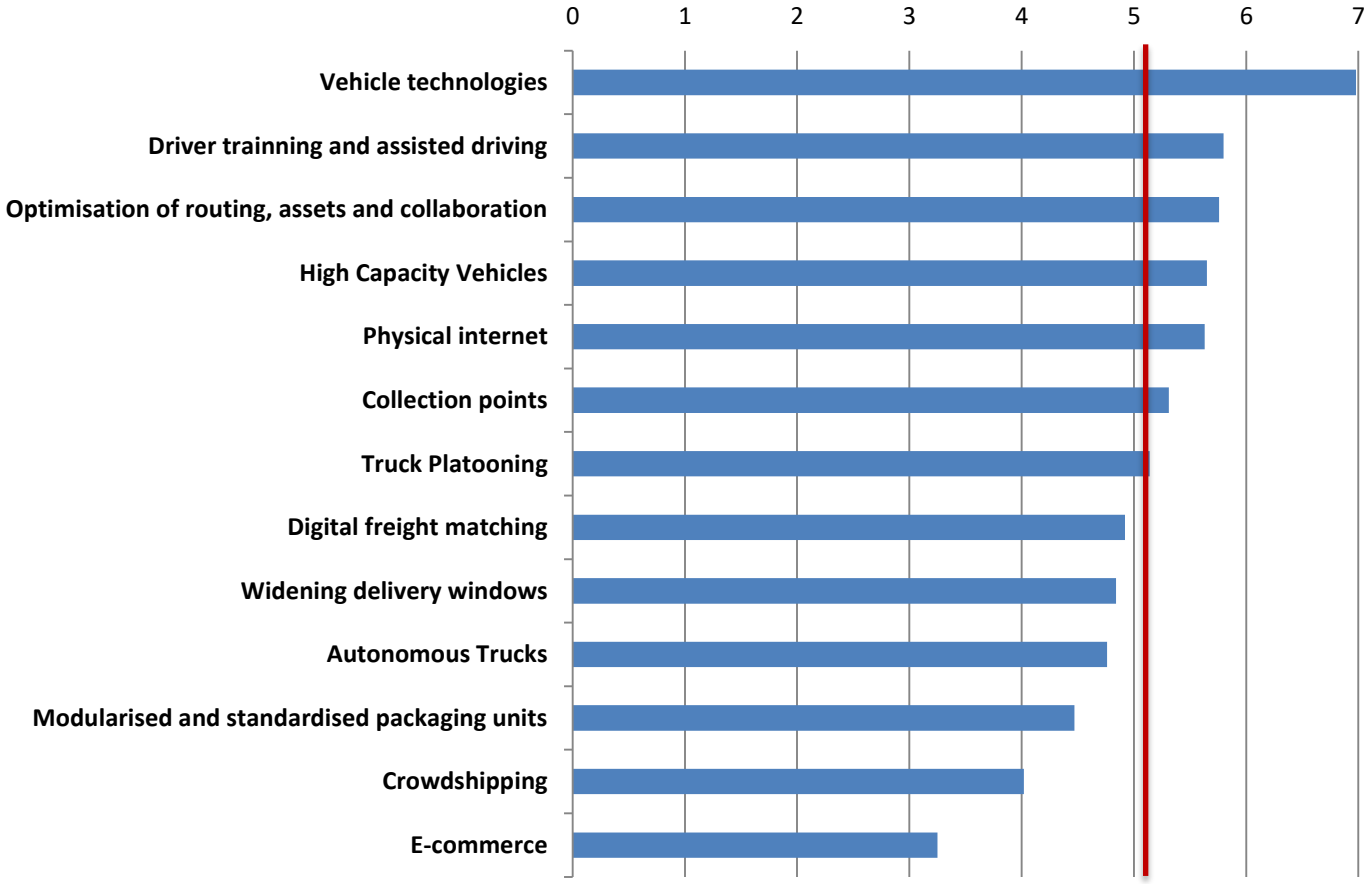
- **Government and regulators almost 30%**
- **Private sector combined 70%**
  - **New entrants will lead on the private side**

International Transport Forum

Summary of results

International Transport Forum

Summary of results



Effective in CO2 reduction?

- Improving vehicle efficiency (vehicle technologies) is the most effective of these alternatives

- E-commerce the worst

International Transport Forum

Summary of results

- **Logistics -** Optimisation and collaboration is the measure that gathers more consensus.
- **Alternative Fuels –** Solution for Urban and Regional. Mixed results for the Long-haul. Charging and supply network is a key barrier.
- **Vehicle efficiency –** High cost-effectiveness of CO2 emissions reduction. Initial costs and lack of strict standards are barriers.
- **Intelligent systems and driver training –** Driver training is cost-effective and has room to grow. Truck platooning and Autonomous trucks benefits will reduce cost. In wide use by 2030-2050.
- **Emerging trends –** E-commerce is to gain speed, which will not help decarbonise the sector. Re-shoring and 3D printing not likely.
- **Challenges and Policy –** Environmental impacts a challenge in High and Middle income countries. Safety and security important in Middle and Low income countries. Shocks with new entrants in High income. Fuel efficiency standards a policy priority (H/M), legal framework (M/L). Infrastructure the most important for Low income group.

International Transport Forum

Global dialogue for better transport

Thank you

Francisco Furtado
Francisco.FURTADO@itf-oecd.org

www.itf-oecd.org

OECD