Chapter 14
Business Models, Economy and Innovation

Patrick Brandtner, Andrea Massimiani, Matthias Neubauer, Oliver Schauer, Wolfgang Schildorfer, and Gerold Wagner

Abstract Emerging technologies may trigger rethinking existing business models, clearly highlighting economic benefits and analysing effects on innovation systems. Truck platooning as one emerging technology in the area of road freight transport promises to improve efficiency and safety and requires different stakeholders (e.g. road operators, freight forwarders, truck manufacturers, etc.) to adapt their business models. In this chapter, key aspects when developing a truck platooning business model from a road operator's perspective will be summarised based on related work and interviews/workshops conducted in the Connecting Austria project. Furthermore, the relevance of ongoing trend monitoring to continuously adapting business models is discussed in this chapter and applied for logistics and automated driving within the Connection Austria consortium.

Keywords Trend monitoring · Truck platooning business model canvas · Truck platooning value proposition canvas

14.1 Key Aspects of a Truck Platooning Business Model from a Road Operator's Perspective

Truck platooning aims to increase efficiency in terms of traffic and fuel efficiency as well as traffic safety. As such, it represents a promising means for different stakeholders to improve future transport of goods. Related work targeted at business models for truck platooning investigates business models for different stakeholders, e.g. road operators, freight forwarders/logistics operators, truck manufacturers or platoon service provider. Freight forwarder will typically benefit from (cf. [9])

- Reduced fuel consumption and fuel costs.
- Reduced emissions and emission-related costs.

P. Brandtner · A. Massimiani · M. Neubauer · O. Schauer · W. Schildorfer (✉) · G. Wagner
Department of Logistics, University of Applied Sciences Upper Austria, Steyr, Austria
e-mail: wolfgang.schildorfer@fh-steyr.at

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- Reduced requirements for drivers when platooning might lead to adaptations of maximum driving times, thus affecting personnel costs and transport times.
- In higher automation levels, driver in following vehicles in a platoon may be allowed to rest; thus, shortening long-distance transport times may be supported.

However, gaining these benefits will depend on influence factors such as (cf. [1, 9, 11])

- Gain sharing model between trucks in a platoon.
- Pricing model of platoon service providers.
- Percentage of highway kilometres eligible for platooning and amount of viable platooning time.
- Penetration of trucks with platooning technology (SAE L1-L5).
- Ability to form multi-fleet, multi-brand platoons.
- National and European legal regulation for truck drivers' resting times or minimum distance between trucks in a platoon.
- Internalisation of external costs (e.g. air pollution) for logistics operators.

Platoon service providers (PSP) are considered to play a crucial role when it comes to the deployment of truck platooning. Central activities of PSPs are the platoon management and the financial clearing between platoon members. Examples for business model elements of truck platooning have already been published by [1, 5, 9, 11, 14]. In Connecting Austria, the support of truck platooning via C-ITS has been a vital element. Lu et al. (cf. [12]) consider C-ITS applications as important means to increase safety, efficiency and sustainability of road transport. They conducted a survey and revealed that respondents consider C-ITS services as important and relevant. However, the study also indicated a low willingness to pay, which demands for sustainable business models. Since C-ITS is an important issue for safe and efficient truck platooning and related work does not discuss business models in the C-ITS context, in addition to previous related work a business model canvas (cf. [15]) for truck platooning has been developed from the point of view of a road operator.

The result is depicted in Fig. 14.1. The results gained in Connecting Austria are based on related work and interviews/workshops, which are referenced using (CA) in Fig. 14.1 . In general, participants of empirical studies conducted in Connecting Austria provided an informed consent to participate and to publish the results. Furthermore, interview data was anonymised and securely stored internally in the University of Applied Sciences Upper Austria. In advance to the empirical studies, the authorisation of the involved parties related to the interviews was provided.

Based on the gathered data, a value proposition canvas (cf. [16]) has been developed for two customer segments. The value proposition canvas especially details the elements "value proposition" and "customer segment" of the business model canvas. The two customer segments investigated in detail are (1) the "government" as owner of public road operators (compare Fig. 14.2) and (2) the "platoon service providers". Since the information (e.g. dynamic information on platooning-eligible highway segments) provided by the road operator is highly relevant for platoon service providers when planning and managing platoons, a value proposition canvas for the customer segment "platoon service provider" has been developed (compare Fig. 14.3).

Key Partnerships

- **European Road Operators** for harmonization of technological standards (C-ITS); e.g. within ASECAP, CEDR. (CA)
- **European platforms and initiatives** (C-ITS Platform, C-Roads, CCAM Platform) for supporting the important role of infrastructure operators within the automated driving domain) (CA)
- **European truck OEMs** for harmonizing C-ITS messages (content and communication layer) (CA)
- **European logistics associations** (e. g. ALICE) for supporting European cross-border deployment of truck-platooning (CA)
- **National logistics associations** for supporting usage of C-ITS (CA)
- **European legal bodies** for adapting road traffic regulations within Europe to support cross-border truck platooning (CA)

Key Activities

- **Operating a dynamic risk-rated map** for truck platooning on road network
- **Dynamic traffic management with C-ITS** using hybrid communication technology approaches (CA) to provide reliable and secure recommendations for platoons (CA)
- **Impact assessment of dynamic platoon traffic information services** (C-ITS day2 service cooperative platooning) with regard to sustainability, safety and traffic efficiency

Key Resources

- **C-ITS infrastructure** (RSU, communication infrastructure) (CA)
- C-ITS supporting **traffic management system** (CA)
- **Dynamic risk-rated map** including necessary sensor data fusion systems and staff know how

Value Propositions

- **Improve traffic flow** performance and stability (Companion)
- **Increase traffic safety** due to supporting truck platooning with dynamic traffic management (e.g. platooning not-allowed message in case of road works or minimum-distance-gap message) (CA)
- **Increase Sustainability** based on dynamic traffic management (CA)
- **Visualisation of platooning-potential** (road network as dynamic risk-rated-map (CA) including road network suitability and reliable dynamic traffic information (Chen et al, 2020) for transport planning purposes
- **Prioritisation of Platoons when possible** (allocated road lanes, especially during the night or in busy traffic situations) (Chen et al, 2020).

Customer Relationships

- **Direct relationships** with drivers as consumers of C-ITS messages on the road
- **Direct relationships** with Haulers, Platooning Service Providers and Navigation solution providers as they all using risk-rated-map content for transport planning
- **Direct relationship** to the government (owner) as funding body

Channels

- Provide information about C-ITS services and dynamic risk-rated-map including platooning via **mass media** targeting CS1
- Supporting the take-up of C-ITS usage including platooning via **key partnerships** (public relation channels and physical meetings) targeting CS2, CS3, CS4.
- Ongoing reporting about the impact and next steps regarding CCAM deployment via **direct communication** targeting CS5

Customer Segments (CS)

(1) **Drivers** (trucks and passenger cars) (SCOUT)
(2) **Hauler** (S4Platooning)
(3) **Platooning Service Provider** (CA); also named as fuel savings sharing service provider (S4Platooning), or match-making service provider (S4Platooning)
(4) **Navigation solution providers** (SCOUT)
(5) **Government** (owner in case of public road operators)

Cost Structures

- **Investments** in road infrastructure, IT and telecom equipment (S4Platooning), **C-ITS infrastructure** (road side units) (Chen et al, 2020); in case of existing C-ITS infrastructure additional costs for truck platooning C-ITS service is only for the technical development of the C-ITS message – no additional hardware costs arise
- Infrastructure **maintenance** and operation (S4Platooning); Challenge - additional expenses for the extension and maintenance of public infrastructure (Companion); However, the Austrian project "Spurvariation" investigated the impact of truck platoons on the road surface and the main conclusion was: An increasing number of truck platoons on Austrian highways will not negatively impact the current road surface (Spurvariation).
- **Investment costs for traffic management** system for adapting to dynamic C-ITS based management
- Ongoing costs for **traffic management system**

Revenue Streams

- Use road capacity more efficiently and lower capacity demands; Lower capacity demands might **reduce maintenance costs** (Companion)
- **Selling Traffic Information** (SCOUT)
- Since these are public services in most countries, the services could be funded by **taxes, road tolls**, or similar. However, there is a large risk that the services would be per country, which would make it difficult for the fairly common cross-border long-haul transportation. (S4Platooning)

Fig. 14.1 Business model canvas for truck platooning from a road operator's point of view. www.strategyzer.com adapted from [15]. Courtesy of Strategyzer AG

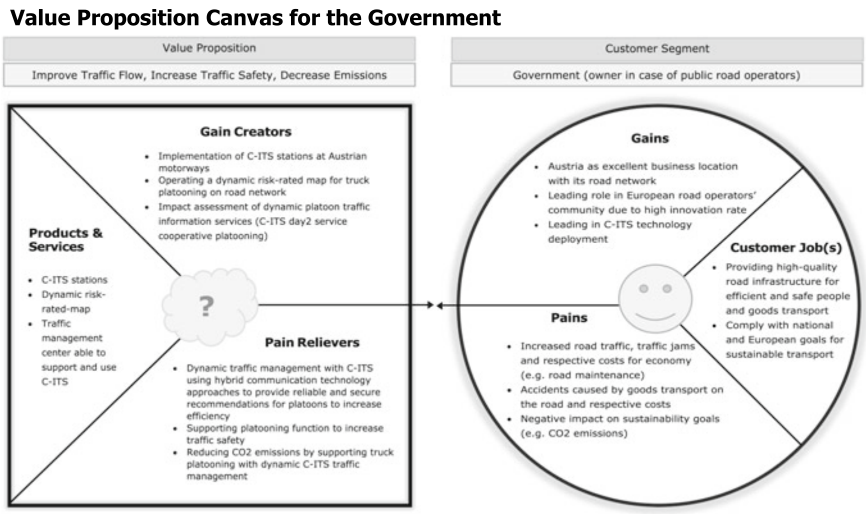

Fig. 14.2 Value proposition canvas for the customer segment government. www.strategyzer.com adapted from [16]. Courtesy of Strategyzer AG

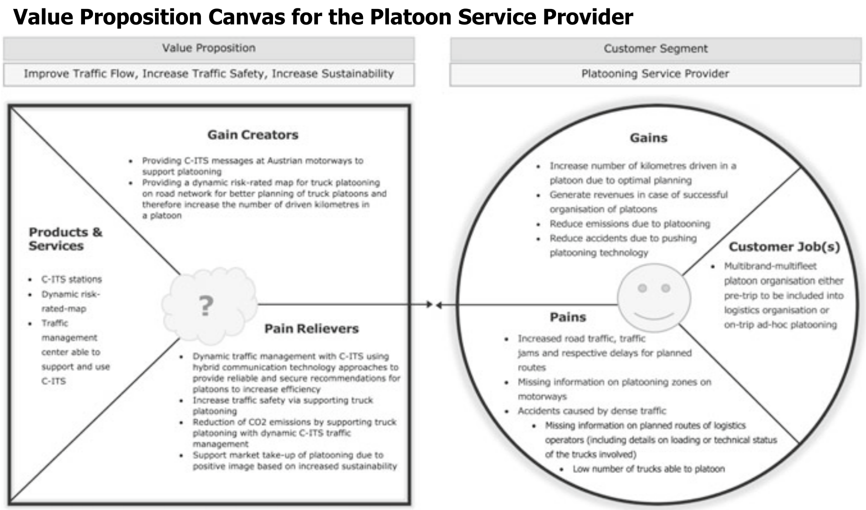

Fig. 14.3 Value proposition canvas for the customer segment platoon service provider. www.strategyzer.com adapted from [16]. Courtesy of Strategyzer AG

The results of analysing both value proposition canvas indicate:

- Commonalities within the customer segments.
  - With regard to **pains** while doing their job(s), both segments suffer from increased road traffic, traffic jams and the respective costs as well as accidents on the motorway and their negative implications.
  - **Gains** for both segments in doing their jobs are to reduce emissions and increase traffic safety due to supporting platooning technology.
- Differences within the customer segments.
  - **Customer Job(s)**: While the platooning service provider focuses on the multi-brand–multi-fleet platoon organisation either pretrip to be included into logistics organisation or on-trip ad hoc platooning, the government defines its jobs as providing high-quality road infrastructure for efficient and safe people and goods transport and complies with national and European goals for sustainable transport.
  - With regard to **pains** while doing their job(s), the differences are: for the platoon service provider, the missing information on planned routes of logistics operators (including details on loading or technical status of the trucks involved) and the low number of trucks able to platoon are the main pain points. For the government, the main pain point is the negative impact of increasing freight transport on sustainability goals (e.g. CO_2 emissions)
  - The **gains** in the customer segments differ as follows: the platooning service provider mainly focuses on the increasing number of kilometres driven in a platoon due to optimal planning and the generation of revenues in case of successful organisation of platoons. In comparison, the main gains for the government are to support Austria as excellent business location with its road network, foster the leading role in European road operators' community due to high innovation rate and enlarge the leading role in C-ITS technology deployment.
- Commonalities within the value proposition.
  - **Products and services** are the same for both customer segments.

    C-ITS stations.
    Dynamic risk-rated map.
    Traffic management centre able to support and use C-ITS.

  - With regard to **gain creators**, for both customer segments the first common issue is providing C-ITS messages at Austrian motorways to support platooning, while the second common gain creator is the provision of a dynamic risk-rated map.
  - The main commonalities with respect to **pain relievers** are

    Dynamic traffic management with C-ITS using hybrid communication technology approaches to provide reliable and secure recommendations for platoons to increase efficiency.
    Increase traffic safety via supporting truck platooning.

Reduction of CO_2 emissions by supporting truck platooning with dynamic C-ITS traffic management.

- Differences within the value proposition.
  - With regard to **gain creators**, there are two differences for the customer segments: only for the customer segment “government”, the implementation of C-ITS stations as well as the C-ITS impact assessment is important.
  - One difference regarding **pain relievers** mentioned is the support of the market take-up of platooning due to positive image based on increased sustainability. Road operators proactive cooperation with truck manufacturers can support this issue and help the customer segment “platooning service provider”.

So far, roadmaps for the deployment of truck platooning systems were presented by different institutions (cf. [5, 13]). Typically, the introduction of automated driving assistance function is structured along the automation levels (SAE L1-L4) and a time horizon. The deployment is considered to be evolutionary, i.e. incremental from one level to the next. To monitor and foster truck platooning deployment, not only vehicle innovations need to be investigated, but also innovations related to intelligent road infrastructures as well as the innovation readiness of logistics operators. For this reason, continuous trend monitoring is crucial to be prepared for future trends and to be able to adjust business models accordingly. Within the next section, trend monitoring as one main key feature for business model development and innovation is explained and applied in the context of logistics and automated driving.

14.2 Trend Monitoring as a Key Feature for Business Model Development and Innovation

14.2.1 Relevance of Trend Monitoring for Business Model Development

Markets, value networks and the organisational environment are changing faster than ever before. Once stable market mechanisms and predictable developments have become more and more instable and complex, developments and trends can hardly be predicted. With emerging topics and technologies such as artificial intelligence, cyber-physical systems, robotics or augmented and mixed reality, organisations have to deal with an increasing amount of strategic uncertainty. The ability to identify relevant trends and developments and to analyse their implications on current businesses becomes a crucial capability. Same applies to deriving opportunities for innovating existing and for generating new business models based on relevant trends (cf. [10]). Once reliable and proven business models may need to be innovated or completely rethought. Systematic and structured trend monitoring provides an approach of how to identify, analyse and continuously re-evaluate relevant trends and developments in the organisational environment. The outputs and findings of trend monitoring represent an important knowledge base for evaluating the applicability and future-fit of existing business models and for deriving potential business model innovation opportunities (cf. [6]). Existing literature shows that organisations with established trend monitoring initiatives can observe and track a larger amount of strategically relevant issues than those without such systems. Trend monitoring activities should not focus on external sources only, but also allow for integrating internal information, sources, networks and structures as well (cf. [2]). A comparison of practices and literature on trend monitoring shows that there are basically three steps involved in trend monitoring activities: (i) definition of search fields, (ii) identification and collection of inputs and trends and (iii) evaluation of trends and deduction of strategic implications (cf. [3]). In step 1, strategic innovation search fields provide the basis for all following activities and lay the foundation for trend identification and input collection (cf. [8]). Within defined search fields, input can systematically be collected and trends can be identified in step 2. Finally, the collected and clearly described trends and developments can be used as the basis for trend evaluation in the third step (Brandtner, 2018). Typical evaluation criteria may include the maturity or the probability of a certain trend and the estimated impact of the trend on the organisation's businesses (cf. [17]).

14.2.2 Applying Trend Monitoring in the Context of Logistics and Automated Driving

Based on the three-step logic of trend monitoring discussed in the previous section, a model for applying trend monitoring in the context of logistics and automated driving was developed. Fig. 14.4 depicts the developed approach:

In step one, a group of researchers and professors in the area of transport logistics, automated driving and strategic foresight respectively trend monitoring defined search terms. This approach ensured the consideration of a complete and domain-based set of keywords and search fields for the subsequent stages of the procedure. Step 2—identification and collection of inputs and trends—was headed by a research associate with expertise in trend monitoring and applying the software TRENDONE. In the third step—evaluation of trends and deduction of strategic implications—the prepared trend profiles were sent out for evaluation to domain experts. In total, 12 experts from the sectors of smart mobility, logistics and transport, research and academia, technology development, public domain, software development and R&D evaluated the trend profiles. All the experts provided an informed consent to participate in the study and to publish the results. Based on the expert evaluations, an aggregated view of the trend profiles was generated and visualised in the form of a trend radar (compare Fig. 14.5).

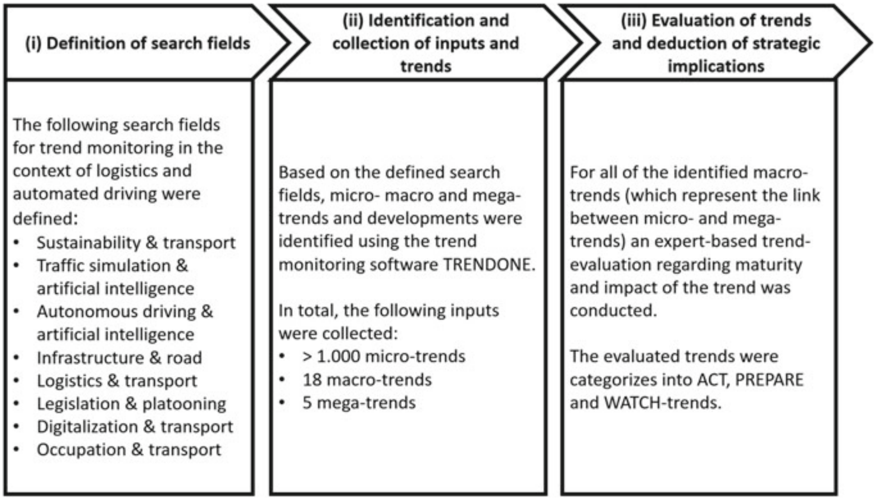

Fig. 14.4 Developed trend monitoring approach for logistics and automated driving

14.2.3 Implications for Business Model Development Related to Logistics and Automated Driving

The results of the trend evaluation and the depiction of these trends on the developed trend radar showed that:

- 5 macro-trends were categorised as ACT trends.
- 11 macro-trends fell into the PREPARE category.
- 2 of the selected macro-trends were WATCH trends.
- None of the selected macro-trends were evaluated as OUT OF SCOPE trend, indicating that the search fields were defined in a focused and matching way.

The final trend radar (compare Fig. 14.5) looks as follows and represents the main outcome of the conducted trend monitoring approach. ACT trends have a high potential of influencing logistics and automated driving already now or at least in the very near future. They show a high degree of maturity and are tangible and applicable in the given context. In the defined field of logistics and automated driving, the participants assigned five trends to the ACT category (cf. Table 14.1). For these ACT trends, the recommendation for action is to integrate them into the current innovation portfolio and start defining concrete actions in these areas. PREPARE trends have a high potential of influencing logistics and automated driving. However, their maturity is not as far progressed as it is the case for ACT trends. Hence, organisations may still have some time to deal with these trends and prepare a strategy on how they get further information. In the given context, 11 trends were identified as PREPARE trends (cf. Table 14.1). Finally, WATCH trends are those trends that currently show little potential of influencing automated driving within the logistics domain but have

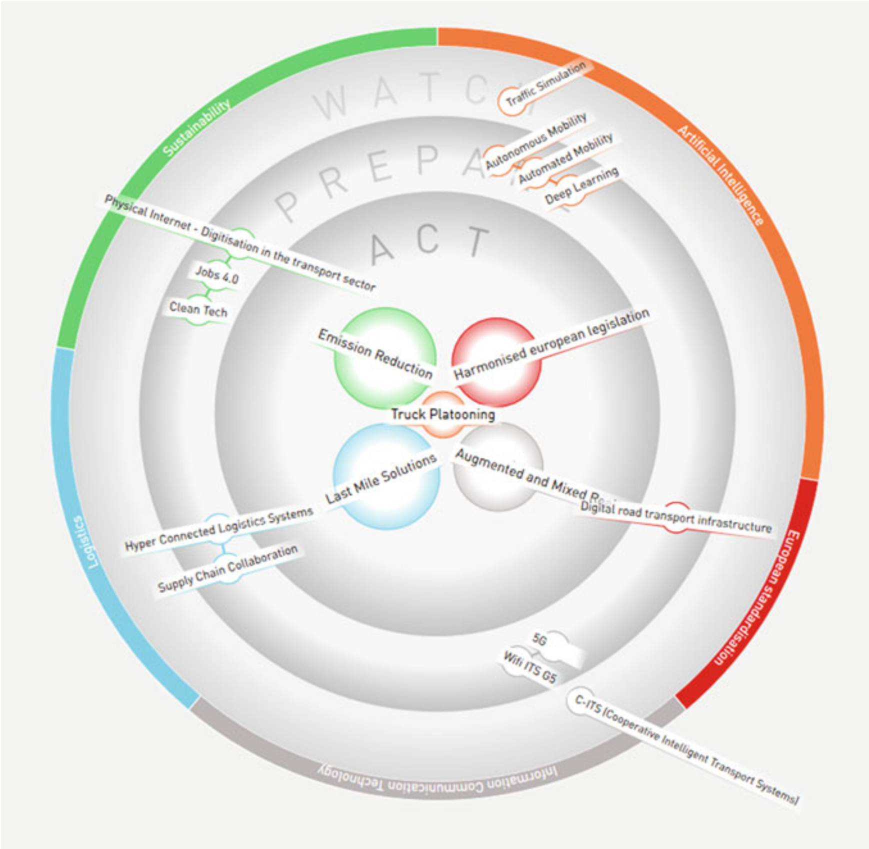

Fig. 14.5 Trend radar for logistics and automated driving

a high degree of maturity. These trends should be watched; i.e. organisation should continuously monitor the developments of these trends also in other industries in order not to miss relevant changes. In the given context, 2 trends were evaluated as WATCH trends (cf. Table 14.1).

14.3 Discussion and Conclusion

A main barrier for innovation and the related investment may represent a technological lock-in effect (cf. [7]). High investment cost in C-ITS infrastructure for road operators has been such a barrier the last years. On a European level, the C-ITS Deployment Platform was set up in 2014 to support a harmonised deployment across European countries (cf. [12]). With ASFINAG's roll-out of C-ITS stations at 2000

Table 14.1 Evaluation results of trend monitoring for automated driving within the logistics domain

ACT	Prepare	Watch
Emission reduction	Autonomous driving	Traffic simulation
Last mile solutions	Automated mobility	C-ITS
Truck platooning	Deep learning	
Harmonised European legislation	5G	
Augmented and mixed reality	P-WiFi (ITS-G5)	
	Digital road infrastructure	
	Clean tech	
	Jobs 4.0	
	Supply chain collaboration	
	Hyperconnected logistics	
	Physical Internet	

highway kilometres in November 2020, the C-ITS deployment started in Austria and the foundation for Day-1 and Day-2 C-ITS services like cooperative platooning was established. Even if the initial investment in Austria took already place, viable business models for the operation, maintenance and the enhancement of C-ITS services are still an open issue. Examples in existing publications propose as revenue streams taxes/tolls, reduced road maintenance costs or earnings from data provision services. However, when developing/deploying new C-ITS services viable business models should be investigated to support road operators and technology providers in taking informed decisions and sustainably deploying C-ITS services.

In addition to the C-ITS business model investigation, the relevance of ongoing trend monitoring to continuously adapting business models was discussed in this contribution. Doing so, a trend monitor related to logistics and automated driving was set up and rated by members of the Connecting Austria consortium. The members identified the following 5 ACT trends—emission reduction, last mile solutions, truck platooning, harmonisation of legislation and augmented and mixed reality. Emission reduction gained momentum in the last decades (cf. European Green Deal) and forces car manufacturers to rethink traditional propulsion systems, logistics operators to optimise transport processes and evaluate solutions for sustainable logistics operations, and road operators to increase traffic efficiency and enforce access regulations (e.g. Urban Access Regulations for Low Emissions Zones). Emission reduction is also crucial in urban areas and demands for innovative and sustainable last mile solutions (delivery robots, pickup stations, etc.). However, also long-distance transport between urban areas needs to be optimised. Truck platooning as such represents a means to increase efficiency and safety. A major prerequisite for truck platooning and automated driving is a harmonised legislation. Especially, long-distance transport across borders with truck platoons requires a harmonisation of legislation in order to support efficient operation and trigger platooning technology providers to offer products. As fifth trend, augmented and mixed reality has been identified as ACT trend. Augmented reality may support truck drivers via displaying relevant driving information (e.g. navigation information, display of C-ITS information). Overall, 11 PREPARE trends have been identified. These trends may be allocated to the following three clusters—automated driving technologies, clean tech and logistics trends. Automated vehicles (SAE L3-L5) are currently under development. Artificial intelligence algorithms (deep learning) and communication technologies such as 5G and ITS-G5 fuel automated driving functions. Furthermore, information provided from the road infrastructure related to the available infrastructure support for automated driving functions (cf. ISAD levels [4]) will be relevant to implement highly automated driving in a safe manner. Logistics trends will adopt new technologies and aim to apply them in order to meet sustainability goals. Furthermore, logistics operators will need to rethink current job profiles especially when it comes to highly automated driving. Clean tech, as third cluster, comprises renewable energy technologies, technologies to reduce emissions, safe energy and resource exploitation.

Finally, two trends—traffic simulation and cooperative intelligent transport systems (C-ITS)—were assigned to the WATCH category. This category typically comprises trends that have a high maturity. However, the trend potential is currently considered to be low or not yet adopted within a given domain. Regarding the judgements of the trend monitor participants, the potential of C-ITS and traffic simulation for automated driving within the logistics domain needs to be monitored, assessed and adopted in future.

References

1. Axelsson J, Bergh T, Mårdberg B, Johansson A, Svenson P, Åkesson V (2020) Truck platooning business case analysis. In: RISE Rapport. Available from: http://urn.kb.se/resolve?urn=urn:nbn:se:ri:diva-44282
2. Brandtner P (2017) Design and evaluation of a process model for the early stages of product innovation. In: New waves in innovation management research - ispim insights: series in innovation studies, pp 149–162
3. Brandtner P, Gaubinger K, Auinger A, Markus Helfert, Rabl M (2014) Dealing with uncertainty in innovation management-an empirical analysis of activities and method use in innovative organizations. In: ISPIM Conference Proceedings, pp 1. The International Society for Professional Innovation Management (ISPIM)
4. Carreras A, Daura X, Erhart J, Ruehrup S (2018) Road infrastructure support levels for automated driving. In: Proceedings of the 25th ITS World Congress, Copenhagen, Denmark, pp 17–21
5. Dubbert J, Wilsch B, Zachäus C, Meyer G (2018) Roadmap for accelerated innovation in level 4/5 connected and automated driving. In: International forum on advanced microsystems for automotive applications. Springer, Berlin, pp 183–194
6. Fergnani A, Hines A, Lanteri A, Esposito M (2020) Corporate foresight in an ever-turbulent era. In: European business review, pp. 6–33
7. Foxon TJ (2014) Technological lock-in and the role of innovation. In: Handbook of sustainable development. Edward Elgar Publishing
8. Groher W, Rademacher F-W, Csillaghy A (2019) Leveraging AI-based decision support for opportunity analysis. Technol Innov Manag Rev 9(12)

9. Hanelt A, Leonhardt D, Hildebrandt B, Piccinini E, Kolbe L (2019) Pushing and pulling – digital business model innovation and dynamic capabilities. In: Journal of competences, strategy & management, vol. 10, pp 55–78
10. Højland J, Rohrbeck R (2018) The role of corporate foresight in exploring new markets-evidence from 3 case studies in the bop markets. Technol Anal Strateg Manag 30(6):734–746
11. Janssen R, Zwijnenberg H, Blankers I, de Kruijff J (2015) Truck platooning–driving the future of transportation. In: TNO: The Hague. Available from: https://repository.tno.nl/islandora/object/uuid%3A778397eb-59d3-4d23-9185-511385b91509
12. Lu M, Türetken O, Adali OE, Castells J, Blokpoel R, Grefen P.W.P.J (2018) C-its (cooperative intelligent transport systems) deployment in Europe: challenges and key findings. In: 25th ITS world congress, pp EU–TP1076
13. Meyer G (2019) European roadmaps, programs, and projects for innovation in connected and automated road transport. In: Road vehicle automation, vol 5. Springer, Berlin, pp 27–39
14. Muratori M, Holden J, Lammert M, Duran A, Young S, Gonder J (2017) Potentials for platooning in us highway freight transport. Technical report, National Renewable Energy Lab.(NREL), Golden, CO (United States)
15. Osterwalder A, Pigneur Y (2010) Business model generation: a handbook for visionaries, game changers, and challengers. Wiley
16. Osterwalder A, Pigneur Y, Bernarda G, Smith A (2014) Value proposition design: how to create products and services customers want. Wiley
17. Pierenkemper C, Gausemeier J (2020) Developing strategies for digital transformation in smes with maturity models. In: ISPIM conference proceedings. The International Society for Professional Innovation Management (ISPIM), pp 1–20

Patrick Brandtner is a professor of supply chain management at the University of Applied Sciences Upper Austria. His research interests cover strategic foresight, data analytics and innovation management in the context of supply chain management. Patrick has been involved in several national and international research projects and teaches in the master's programs supply chain management as well as digital transport and logistics management classes such as innovation methods in logistics and transport, data analytics or design thinking.

Andrea Massimiani born 1975, studied, after her active career as a competitive athlete, economics at the Johannes Kepler University of Linz and gained extensive experience in banking and industry. She is a research associate at the University of Applied Sciences Upper Austria, focusing on trend monitoring, corporate foresight and retail logistics.

Matthias Neubauer is a professor at the University of Applied Sciences Upper Austria for logistics information systems. His research interests cover human-computer interaction, intelligent transportation systems as well as cooperative, connected and automated mobility. Matthias is involved in international and national research projects and teaches in the master's program digital transport and logistics management classes such as process management, distributed logistics systems or geoinformation systems.

Oliver Schauer works as a professor in transport logistics and mobility at the University of Applied Sciences Upper Austria, with emphasis on the fields of sustainable logistics, Physical Internet and digital transformation. He is also head of studies of the master's program "Digital Transport- and Logistics-Management". Prior to his actual profession Oliver gained strong experience in the executive management of leading Austrian logistics providers.

Wolfgang Schildorfer is a person who likes the road he still walks to find new chances. Since October 2018, he has been Professor for Transport Logistics and Mobility at the University of Applied Sciences Upper Austria. His research focus is on innovation, business models and evaluation in transport logistics, smart hyperconnected logistics systems, (urban) mobility, sustainable

transport systems and new technology markets (C-ITS, CCAM, automated driving, truck platooning).

Gerold Wagner is a professor for business informatics at the University of Applied Sciences Upper Austria. His research interests cover business information systems, new business models and E-Learning. Gerold is coordinator of the master's program supply chain management and is involved in national and international research projects.