

# Reader

*Current Trends and Selected In-depth Information  
Road Transport*

Section:

RE  Road

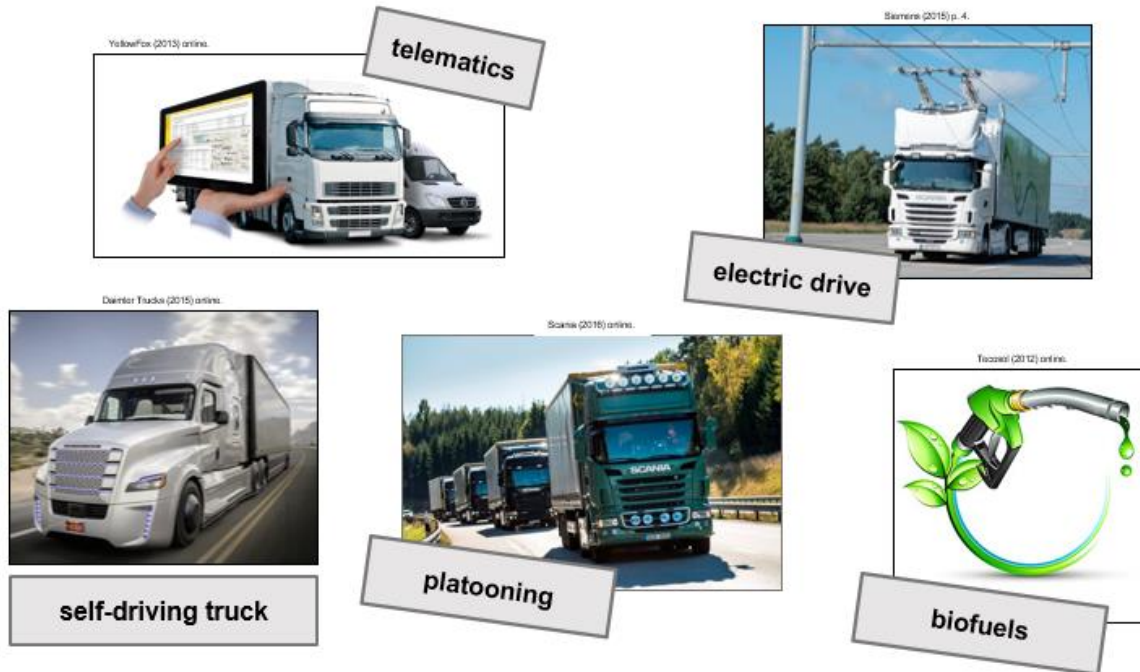
Research & Education on Road Transport Logistics



***This reader supplements the Power Point presentation on current trends and selected in-depth information on road transport, doubling as a script.***

## Overview

This reader on road transport and the slide set it is based on are structured as follows:



## Selected Trends & Developments in Road Freight Transport

Since the modes of transport are subject to ongoing changes due to a variety of aspects (e.g. technical, natural, social or cultural nature), the in-depth part of the information on the subject of "road transport" is devoted to a closer examination of selected trends and developments in road freight transport. The focus is on the following topics, providing brief overviews of:

- self-driving (autonomous) trucks
- platooning
- electric drive using the "eHighway" as an example
- biofuels
- telematics

## Self-driving Truck

The concept of the self-driving or autonomous truck is based on the autopilot function in an aircraft. This function automatically determines and maintains lane, vehicle distance and speed, using various systems (radar sensors, stereo cameras, assistance systems or distance controllers). However, the new application does not replace drivers in road freight transport. Rather, they still have control over the vehicle and can decide individually when to switch the autonomous system on or off. Especially in situations no longer controllable by the autopilot (e.g. thunderstorms or narrow loading and unloading areas), the driver takes over again. If the driver does not react (even after repeated signalling) for whatever reason, braking is automatically initiated for safety reasons.<sup>1</sup>

### Strengths of the concept:<sup>2</sup>

- Increased efficiency (around 5% fuel reduction)
- Increased safety (e.g. reduced accident risk)
- Enhanced job profile "truck driver" (can take on new tasks, e.g. from scheduling)

### Weaknesses of the concept:

- Legal hurdles (e.g. Vienna Convention)
- Different national legal situations

## Platooning

The term "platooning" is a military term and can be described as a "truck convoy" or "networked columns". "Platooning" works like a classic freight train, with trucks instead of wagons attached to each other. Individual trucks are linked through innovative technologies (WLAN, GPS, Wi-Fi, etc.) and equipped with cutting edge systems (e.g. automatic braking systems or distance regulators). The driving behaviour of the group of trucks is controlled by the first truck. The vehicles travel at a speed of about 80 km/h at a constant distance of about 5 m. In the long run such a "train" could consist of up to 10 trucks and in addition to networked vehicles, a network with the infrastructure should be possible, too. Autonomous driving of trucks forms an important basis for this.<sup>3</sup>

<sup>1</sup> Cf. APA (2015) online; cf. Postinett (2015) online; cf. AFP (2015) online; cf. APA/DPA (2015) online.

<sup>2</sup> See Verkehrsrundschau (2015) 2:16-10:04 min.; see Postinett (2015) online.

<sup>3</sup> Cf. Bay (2016) online; cf. European Truck Platooning Challenge (2016a) online; cf. Christof (2015) online; cf. Holzer (2016) online; cf. Scania Group (2013) 0:00-2:12.

Strengths associated with this concept:<sup>4</sup>

- Reduction of waiting times (better traffic flow)
- Increased efficiency (optimum capacity utilisation, reduced congestion, better coordination of loading and unloading)
- Reduced environmental impact

Resulting weaknesses from this concept:<sup>5</sup>

- Increased road transport and stronger burden on infrastructure by more freight transport in the future
- Legal hurdles
- Different national regulations

**Electric Drive exemplified by "eHighway"**

**Strengths**

- reduction of waiting times
- economical goods transport
- high flexibility

**Weaknesses**

- investment and implementation costs
- possibility of overuse

The "eHighway" concept is based on a combination of hybrid drive and electrical power supply. The electrical energy is drawn from an overhead line, as in rail transport, or supplemented by a classic combustion engine, fuel cells or biofuels in the absence of an overhead line. A scanner in the truck checks the availability of an overhead line and can be coupled to it automatically or manually.<sup>6</sup>

Strengths associated with this concept:<sup>7</sup>

- environment protection because of no exclusive use of combustion engines
- economical freight transport with cost advantages
- fast implementation

Resulting weaknesses from this concept:<sup>8</sup>

- investment and implementation costs occur, depending on the conditions on individual routes)
- earthing of overhead lines, especially in the event of accidents

**Biofuels**

**Strengths**

- especially: immediately available or already in use
- lower emissions

**Weaknesses**

- use of food
- higher land use for production

<sup>4</sup> See Bay (2016) online; see European Truck Platooning Challenge (2016a) online; see Christof (2015) online; see Holzer (2016) online; see Scania Group (2013) 0:00-2:12.

<sup>5</sup> See Bay (2016) online; see Christof (2015) online; see Holzer (2016) online.

<sup>6</sup> See Siemens AG (2012) p. 4 ff; see Randelhoff (2012) online; Siemens AG (2014) 0:00-2:01.

<sup>7</sup> See Siemens AG (2012) p. 4 ff; see Randelhoff (2012) online.

<sup>8</sup> See Randelhoff (2012) online.

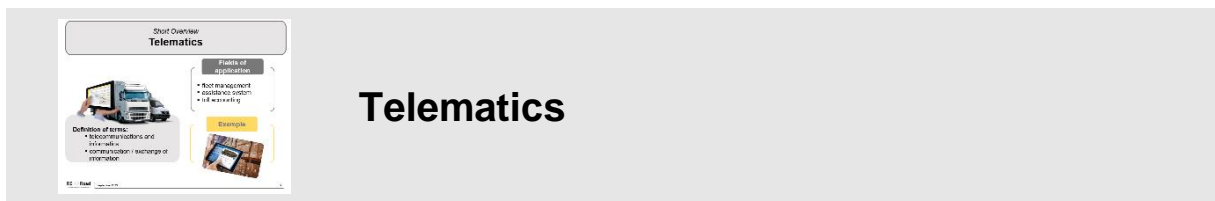
Biofuels can be described by their generations. The first generation comprises bioethanol (mainly from cereals, such as wheat and corn, or sugar beet) and biodiesel (from rapeseed, vegetable oils or waste materials such as animal fats). The second generation includes biomethane (bio natural gas) - produced from the primary product "biogas" -, cellulose-ethanol (raw material: cellulose from straw or wood waste) or BtL fuels (biomass-to-liquid). The third and last generation includes above all the extraction of biofuel from algae or special cultivated plants.<sup>9</sup>

Strengths associated with this concept:<sup>10</sup>

- can be used with many commercial vehicles without major conversions
- lower emissions

Resulting weaknesses from this concept:<sup>11</sup>

- use of food, with consequently rising prices
- increasing land use for extraction, resulting in destruction of biodiversity & impact on greenhouse gases



The term "telematics" links telecommunications and information technology, forming an important basis for our daily activities (e.g. traffic control systems or automatic parking guidance systems). Among other things, telematics is intended to facilitate communication between operators. In the transport sector, the vehicle requires, for example, a peripheral device for the recording and transmission of information or data (e.g. an on-board computer).<sup>12</sup>

Opportunities for road freight transport:<sup>13</sup>

- easier transport planning (e.g. avoidance of empty runs)
- easier order processing (e.g. increasing flexibility, avoiding disruptions, increasing delivery reliability)
- facilitated fleet management
- tracking of shipments (plus enhanced customer retention rates)
- vehicle monitoring, e.g. aiming at reduced fuel consumption and environmental impact
- linking modes of transport, e.g. rail and road

<sup>9</sup> Cf. WKO (2016) p. 36; Cf. Unabhängiges Institut für Umweltfragen (no year) slide 22.

<sup>10</sup> See Shell Deutschland Oil GmbH (2010) p. 38 ff; see ARD Mittagmagazin (2012) 0:00-2:47.

<sup>11</sup> See WKO (2016) p. 36; see Shell Deutschland Oil GmbH (2010) p. 38 ff; see ARD Mittagmagazin (2012) 0:00-2:47.

<sup>12</sup> See Berg/Rolf (no year) p. 2 ff.

<sup>13</sup> See Berg/Rolf (no year) p. 2 ff; see Andres (2003) p. 3 ff.

Potential application areas for telematics in road traffic:<sup>14</sup>

- fleet management for monitoring and contacting individual vehicles
- vehicle assistance system (for recording and interpreting data; collecting information about trailers)
- tolls collection and calculation

Example "deTAGtive logistics":

This telematics application aims at worldwide monitoring of goods transport with "tags", which can be easily attached to individual goods or transport units.<sup>15</sup> This is especially vital for dangerous and sensitive freight, or verification of compliance with freight and transport conditions.

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<sup>14</sup> Cf. Bäumler (2015) p. 22 ff.

<sup>15</sup> See Openmatics s.r.o. (o.J.a.) online.

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