

Summary

Finnish transport policies at the national and regional levels

National level

The next pages contain information on the following strategies and operational programmes:

- Transport policy review of the Prime Minister's Office (2012)
- New transport policies of the Sipilä government (2015)
- Group strategy for the Ministry of Transport and Communications' administrative branch 2016–2020
- Finland's maritime strategy for 2014–2022
- Finland's Air Transport Strategy 2015-2030
- Automation Roadmap and Operational Programme 2016 -2020

Transport policy review of the Prime Minister's Office (2012)

- In the transport policy review (Prime Minister's Office 2012) the state transport policy is closely linked to the prerequisites for business life, economy and employment, and regional development.
- Background:
 - Transport policy ensures smooth transport that corresponds to the needs of industry.
 - The **transport system is a key competitive factor for Finland** due to the length of the country and long distances of transport. Industrial production is located around the country and the forestry and metal industry companies transporting heavy goods have accounted for a large share of production.
 - The role of maritime traffic in foreign trade is dominant
 - **Seamlessness of logistics chains** is a key service level factor for freight transport.
- The review contains a long list of alignments and action points that are presented on the next slides

Transport policy review of the Prime Minister's Office (2012)

- Alignments and action points concerning funding
 - The budgetary practices of the state are developed to allow **long term solutions** and to enable state participation in **multi-year contracts** in public transport and fairway maintenance
 - 100 MEUR/year of fairway investments are redirected to small investments and maintenance of the transport system 2016 onwards
- Alignments and action points concerning transport system and sustainable growth
 - The operating conditions of the Finnish export industry and the **competitiveness of the logistics industry** is ensured
 - The **proper condition of the main transport network** is primarily ensured while the condition of the lower transport network depends on availability of funding
 - **Maintaining critical and costly structures** such as bridges and tunnels is a key part of life-cycle efficiency
 - The **logistical reliability of the transport system** and transport services is being developed in cooperation between the authorities and the business community to ensure continuation also in exceptional circumstances

Transport policy review of the Prime Minister's Office (2012)

- **A state of the art understanding of traffic system**, based on up-to-date information, is created
- A comprehensive national maritime strategy will be developed
- **Rail routes with very low freight** are not repaired, but basic traffic conditions are maintained on a case-by-case basis
- **Development needs of inland waterway transport** will be updated
- Alignments and action points concerning every day functionality
 - The functionality of transport in the largest and growing urban areas will be prioritised
- Alignments and action points concerning for safe and smart traffic
 - Development of **sustainable fuels and low-emission vehicle technologies** is promoted
 - Development and deployment of marine fuels is promoted to reduce the emissions of the Baltic Sea
- Alignments and action points concerning for efficient activities
 - A joint effort of several countries - E18 Growth Corridor (Oslo-Stockholm-Turku-Helsinki-Saint-Petersburg) will be launched

Transport policy review of the Prime Minister's Office (2012)

- Alignments and action points concerning specific transport policy issues in 2010s
 - The state is ready to participate in financing of rail transport investments in major urban areas (Helsinki, Turku and Tampere regions). The starting point is that urban rail projects are implemented on a 50-50 basis between the state and municipalities
 - The state assists the construction of metro and urban railways with a 30 % share
 - An aviation strategy is created
 - Growth of traffic from Russia and to Russia is acknowledged and **capacity and functionality** of border and border crossing points and cross-border traffic routes is ensured
 - The state is prepared to develop **the elements of the TEN-T core network** to meet the standards required by the end of 2030

New transport policies of the Sipilä government (2015)

- Funding targeted to spearhead projects such as **decreasing the route correction dept**
- Transport and communication policies meet in the spearhead projects: mobility as a service (MaaS), infrastructure as a platform, digitalisation as a means for well-being and growth
- **Logistics is also changing**: from the manufacturer to the client, big data, Internet of Things, automated logistics, industrial internet, 3D printing, disruptions through startups
- Transport and regional development
 - Transport policy will be based on MaaS-model to boost growth and create new business and to increase effectiveness
 - In the route system priority is given to actions required for the daily serviceability of the transport network as well as for halting the correction of debt and its controlled reduction.
- New projects at the state level: Creating opportunities for digital business in the transport sector, through transport arch, streamlining regulation of different modes of transport as well as simplifying regulation and eliminating overlapping standards

Group strategy for the Ministry of Transport and Communications' administrative branch 2016–2020

- Rationale: The strategy implements Prime Minister Juha Sipilä's Government Programme and is based on the Futures review published by the ministry in spring 2014.
- Servitization of transport creates opportunities to organize **seamless service packages by combining transport modes**. At the same time, traffic emissions are reduced and transport energy reform can be implemented.
- Energy reform: The aim is that new sources of energy will reduce oil dependence in all modes of transport and that the **transport sector will have a strong role to play in pioneering clean technology**.
- Infrastructure: Traffic conditions, especially roads and tracks, have deteriorated, which is reflected in users as degrading traffic conditions, speed and weight restrictions, and security shortcomings. Inputs in the transport network will be made by investing in the network system gradually during the government term. According to the Government Programme, the emphasis is on the **condition and quality of transport routes**. The rapid growth of route correction debts will be halted and reduced in a controlled manner. Lifecycle efficiency is one of the key objectives. The target is a significant slowdown in the route correction debt.

Finland's maritime strategy for 2014–2022

- Rationale: **Functional transport routes** are the vital **prerequisite for the competitiveness of Finnish industry** and hence the competitiveness of society as a whole.
- Key aim in the strategy is to ensure well-functioning sea transport and maritime industries taking into account national competitiveness and environmental and safety issues.
- A vision for 2030 is “A prosperous Finland – smart sea routes”.
 - objective is to ensure that Finnish foreign trade and domestic waterborne transport are smoothly functioning and socio-economically viable and international competitiveness is ensured also in winter.
 - Industry is served with **reliable transport chains** to minimize the disadvantages of winter conditions and by ensuring that transport costs remain at a moderate level.
 - Finnish maritime transport sector will become the leading service provider of the Baltic Sea countries in terms of **sustainable logistic concepts**.

Finland's maritime strategy for 2014–2022 – strategic spearheads

- Efficient and competitive transport chains
 - Developing and maintaining of a fairway corresponding to the **needs of shipping and inland waterway transport**
 - Developing the preparedness of **shipping and ports as part of an overall logistic system**
- Green growth from a strong maritime cluster
 - Improving the financing opportunities for shipbuilding to modernize the fleet and to explore the possibilities for new financing arrangements, taking into account the possibilities offered by the European Investment Bank and the Nordic Investment Bank
 - Promoting **the development and deployment of alternative fuel solutions** and implementing the LNG operational program for shipping 2013 to 2017.
- International activities
 - Ensuring **Finland's accessibility in EU regulation** (including the Trans-European Transport Network TEN-T)

Finland's Air Transport Strategy 2015-2030

- Rationale: Government Transport policy review 2012 -> An aviation strategy will be drawn up, which will outline the prospects for aviation and will assess, in particular, from the point of view of transport policy and the **accessibility of the regions**, the appropriateness of the Finnish airport network and the role of the state in the organization of air transport services.
- Vision: Air transport supports the growth and development potential of the Finnish economy and the competitiveness of our country.
- Spearheads
 - Promoting growth in air traffic by **creating and developing travel chains** and support structures for the operation of travel chains and the entire public transport system, for example through regional pilot and travel chain projects.
 - Lapland and Northern Finland airports, air links and travel chains with public transport links to airports will be developed as a whole
 - East-Finland airports, air links and travel chains with public transport links will be developed

Automation Roadmap and Operational Programme 2016 -2020

- Background: It is foreseen that automation of road traffic proceeds rapidly utilizing existing and emerging cooperative Advanced Driver Assistance System (ADAS) and In-Vehicle System (IVS) sensor functionalities. According to the Ministry of Transport and Communications, **Finland is at the forefront in preparing and utilizing the possibilities of automated traffic.**
- Regarding infrastructure it is acknowledged that **requirements for the road infrastructure vary depending on the level of automation, the road environment and the road users involved.** Automation is the most challenging on the street network because different types of movers are in transit in the same environment and the traffic environment is very heterogeneous. Automation has several implications for infrastructure: e.g. road construction requirements and maintenance requirements may change, the design and design requirements of the connections can also change.
- Many challenges still remain, with current technologies the biggest being environmental awareness: the automatic vehicle **should be able to handle and classify the environment at least on the same level and in the same time as human being.** This requires efficient parallel computing. Additionally increasing automation in vehicles **can lead to deterioration in situational awareness** of the driver.

Automation Roadmap and Operational Programme 2016 -2020

- The roadmap takes the above mentioned into account and combines it with information from literature review, existing knowledge, background information and news. Based on these, the situation, conditions, events and activities in road traffic were thought-out, where automation of road traffic can be estimated to cause the need for change. The main aim is to achieve **a state where the operation of automotive vehicles could be safe, logical and predetermined.**
- Consequently, the automation roadmap is divided into the following domains: infrastructure, pavement and equipment, in-vehicle systems, services and functions, and driver. Altogether 49 action points were identified within the five domains. These form the operational programme aiming at identifying and scheduling the most important public sector measures needed to promote automated deployment and at least automate level 3 automation in Finland by 2020.
- Specific attention was paid to reaching agreement within the administrative sector to on the way forward, responsibilities and timetables.
- It should be noticed that the operational programme does not contain significant legislative measures. Furthermore, the operational programme only covers years 2016-2017, because the more detailed planning of the 2018-2020 measures involved too much uncertainty in order to allow for more detailed resourcing and budgeting.

Automation Roadmap and Operational Programme 2016 -2020

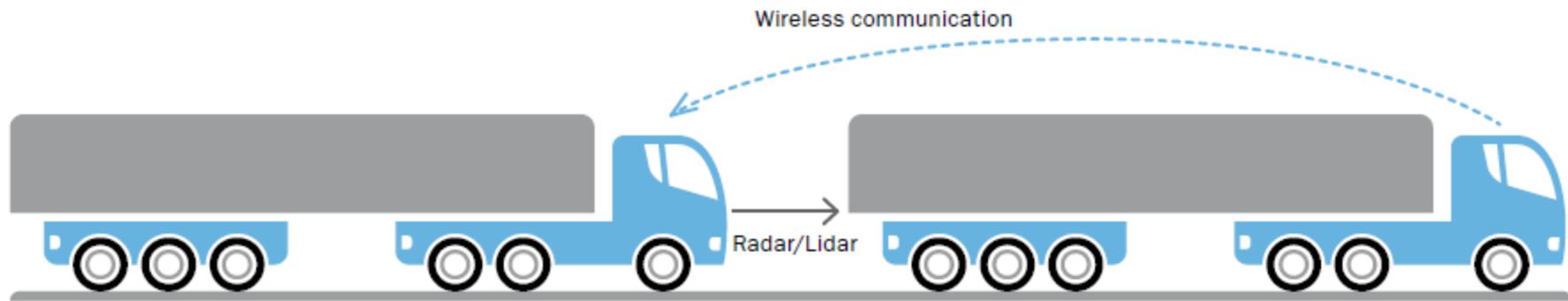
- Examples of action points under the five domains
 - Infrastructure
 - Finland is prepared to ensure that the motorway network is firstly assigned to automated traffic
 - Pavement and equipment
 - Road markings and road signs are machine-readable and visible and are well-suited for use by Advanced Driver Assistance System and In-Vehicle System sensor functionalities in specified weather conditions
 - In-vehicle systems
 - Figuring out the impact of level 3 cars on traffic causes for traffic safety, traffic flow, and other factors
 - Services and functions
 - Promoting and supporting the launch of road and street networks, their equipment and infrastructure, and the testing of vehicles and driver test areas.
 - Driver
 - Exploring how automated systems and e.g. platooning affect driver working time legislation

Automation Roadmap and Operational Programme 2016 -2020: Platooning

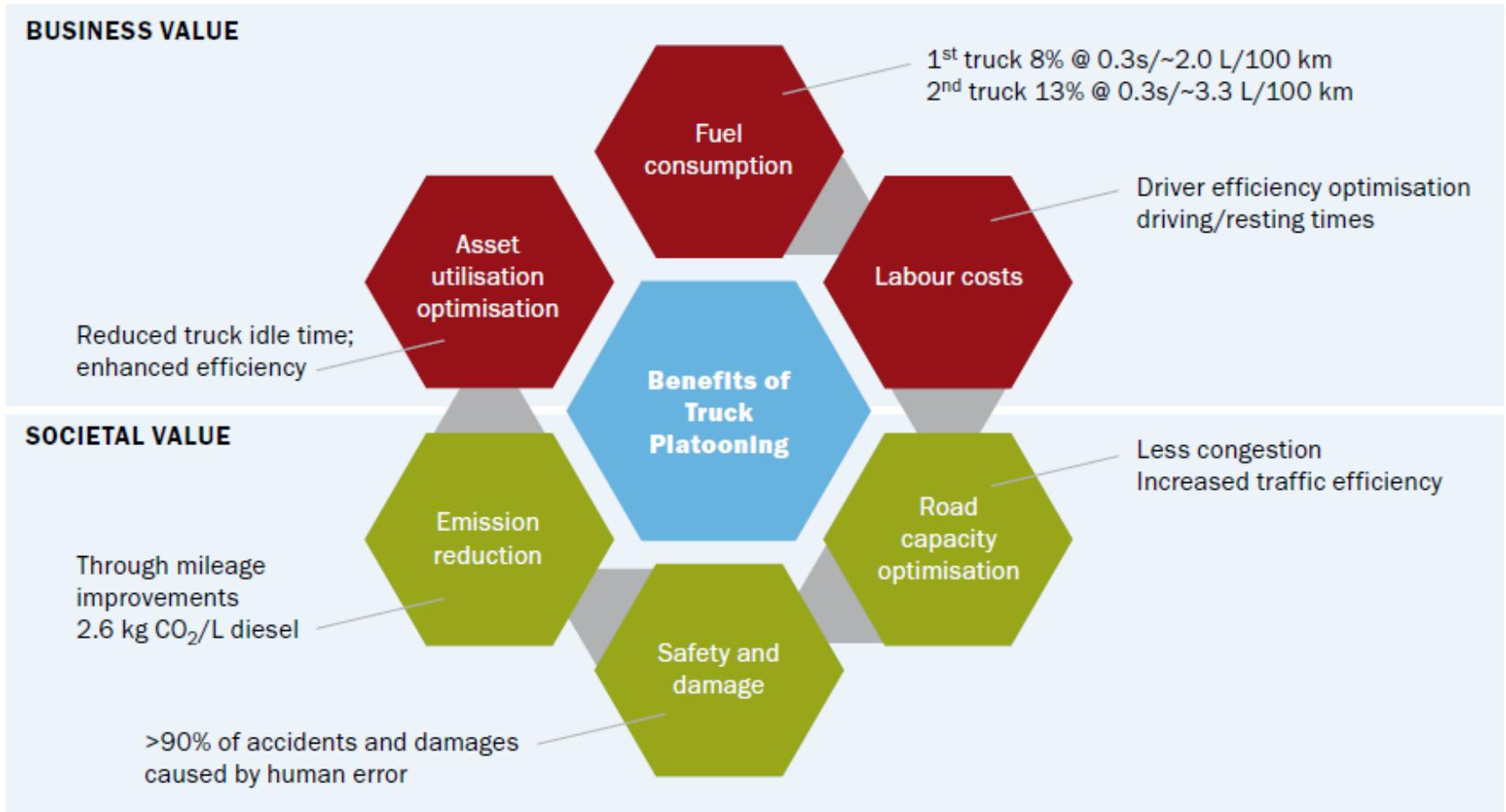
- In the context of smart mobility the European Commission recognises the importance of the transport industry: “Transport is fundamental to our economy and society. Transport enables economic growth and job creation” .
- Truck platooning is a key concept for Automatization of Long Haul Road Transport.
- Truck platooning is also recognized by the Finnish Ministry of Transport and Communications. The ministry has published Automation Roadmap and Operational Programme 2016 – 2020 –report. The report outlines that **Finland should participate in truck platooning demonstrations.**

Platooning - Automation of Long Haul Road Transport

- Truck platooning is considered to be the future of transportation in which trucks drive cooperatively at less than 1 second apart made possible by automated driving technology.



Platooning - Benefits



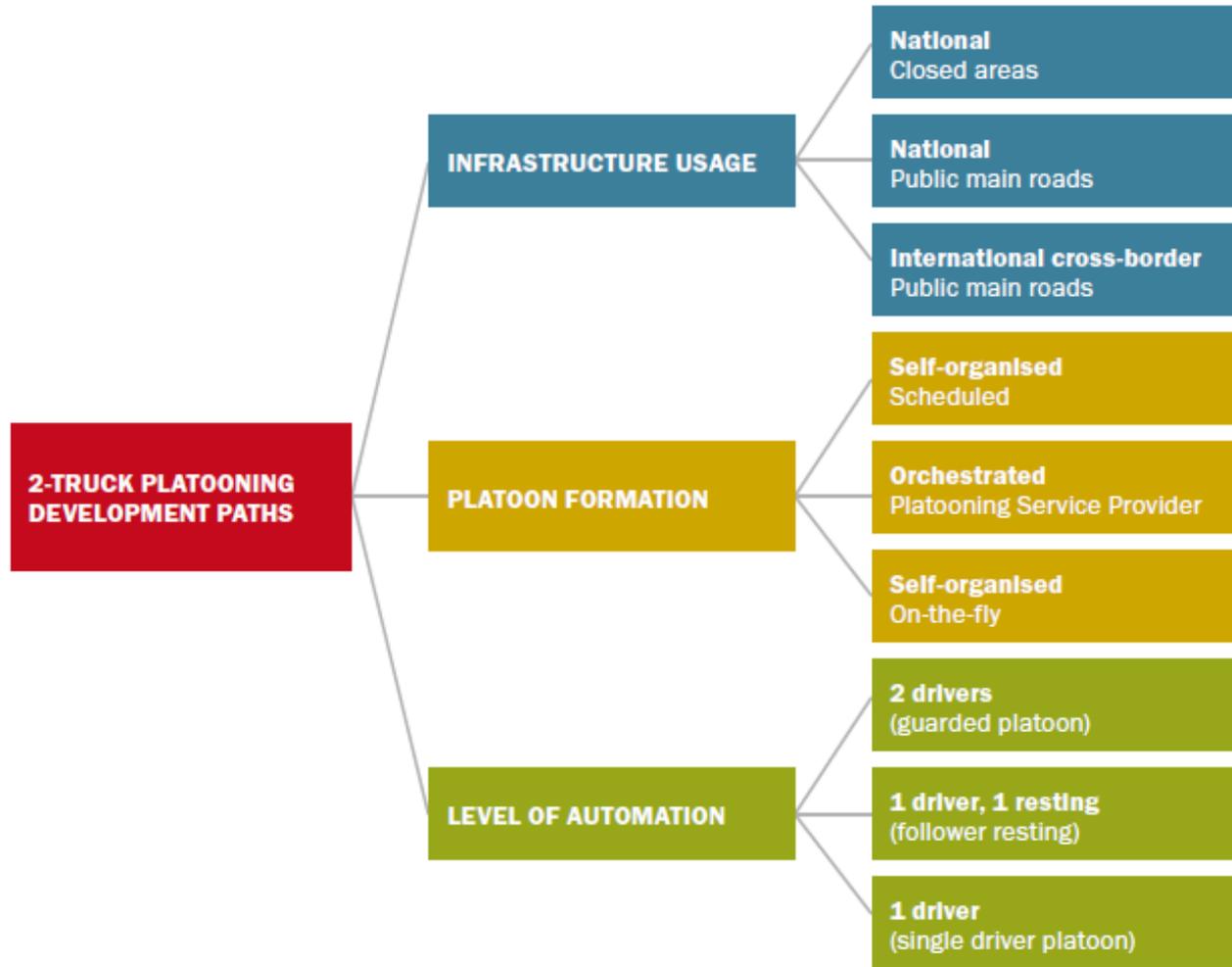
Platooning –cost benefit estimation

Factors taken into account	Explanation	Assumptions
Benefits		
Fuel consumption	The savings of fuel usage over the platooning route, stemming from air drag reduction	<ul style="list-style-type: none"> - 10% reduction of fuel for both trucks, an average of the Leading and Following Vehicle ¹⁴ - Average fuel consumption of 4 km/L ²³ - Price of diesel € 1.20 per litre ²⁴
Labour cost	Two scenario's: A. 2 trucks-2 drivers. Resting times can be reduced. B. 2 trucks -1 driver. Part of the time, a driver can be omitted.	<ul style="list-style-type: none"> - Labour costs of € 20 to € 25 per hour per driver, dependent on the carrier - The labour costs of the reduction in man-hours, are the savings <p>Scenario A. 8% savings in resting times per day Scenario B. Reduction in man-hours of 15% to 25%, depending on case</p>
Asset utilisation optimisation	Only applicable in Scenario A. 2 trucks-2 drivers. The truck is additionally employable for the reduction in resting times per driver.	<p>Scenario A. 2 trucks-2 drivers</p> <ul style="list-style-type: none"> - A truck is worth € 4 per hour, based on depreciation of a € 160,000 truck combination, over 7 years. We assume the truck is used 51 weeks a year, 110 hours a week.

Platooning –cost benefit estimation

Factors taken into account	Explanation	Assumptions
Costs		
Technology	Annual depreciation of the technology	- Technology costs € 2,000 per truck - Average depreciation period for a truck is 7 years
Service Provider	Annual membership costs for service provider	- € 150 per year per truck
Additional periodic testing	Annual costs for additional testing & maintenance	- € 150 per year per truck
Training drivers	Annual depreciation for the training	- € 75 per year per driver

Platooning - Development paths



Platooning - Latest development

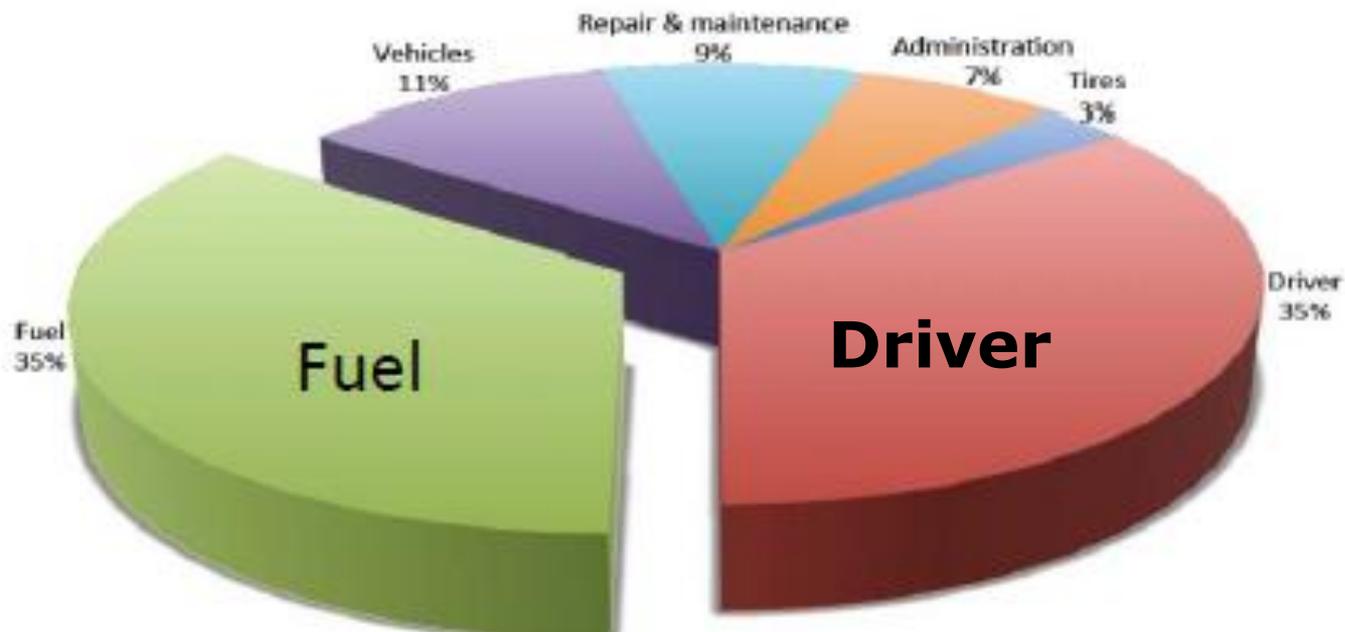
- According to the EU countries around the world (e.g. the US, Australia, Japan, South Korea and China) are rapidly switching to the introduction of digital technology, and in some countries, such vehicles and communicative ITS services are already available on the market. For instance in Australia a mining company has deployed 69 fully autonomous vehicles for the transport of iron ore in internal mining operations.
- In Europe Scania cooperates with Ericsson to develop connected services that enhance efficiency for owners and drivers. Scania has also announced that it will design **full-scale autonomous truck platooning operations**, based on its own advanced technology. It has been planned that the platoon will traffic public roads while transporting containers between port terminals in Singapore. The aim is to organise convoys of four trucks – with the following three trucks behind the lead truck autonomously driven, as well as to fully automate the processes for precise docking and undocking of cargo.

Platooning – Expected benefits

- Peloton Technology, a startup company developer of autonomous systems for truck firms and Omnitrac LLC, provider of dispatching, routing and other services to large U.S. trucking fleets have formed a partnership to **provide "platooning" technology** that is expected to allow Omnitrac's customers to run small, partly automated truck convoys. According to Peloton, tests show its **platooning technology saves the first truck 4.5 percent on fuel and 10 percent for the second truck**. The timeline for when platooning technology would become available to Omnitrac customers is still unclear.
- In addition to Peloton and Omnitrac, other truck manufacturers such as Daimler AG and startups are experimenting with platooning and autonomous technologies.
- However, there are still some legislative barriers to platooning in the US. There are 21 states with numerical following distance rules which require legislative action to authorize freight platooning operations.

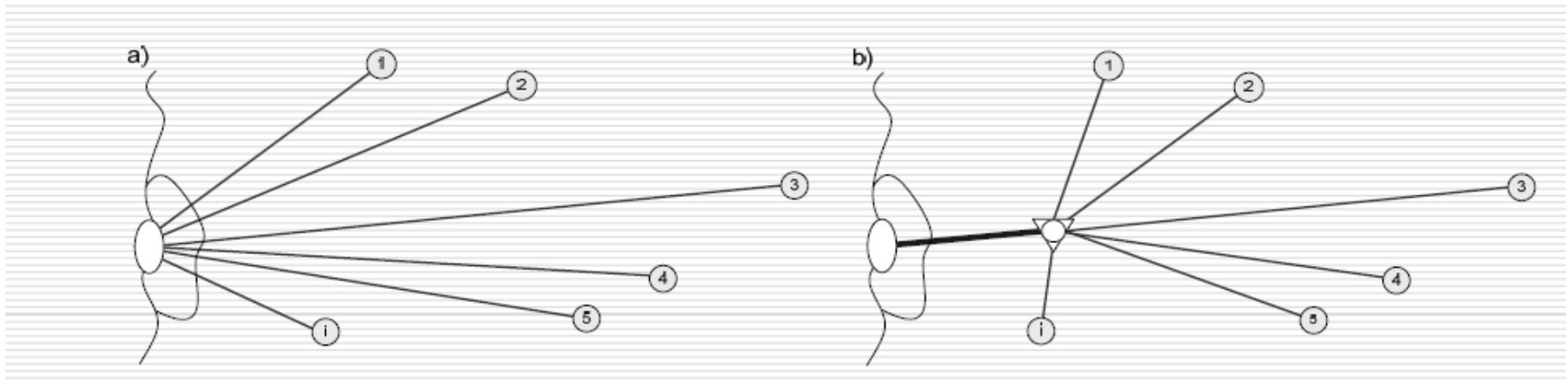
Platooning – possible utilisation in the Baltic Sea Region

- Life cycle cost structure for European heavy duty vehicle highlights the fuel and driver cost. Platooning can offer significant savings.



Platooning – possible utilisation in the Baltic Sea Region

- Platooning can offer a real road train solution between a sea port and a Dry Port and thus support the Dry Port concept.



Regional

The next pages contain information on the following strategies and operational programmes:

- East Finland's transport strategy
- Transport system plan of Päijät-Häme region 2014
- Smart Tampere (Pirkanmaa region)

East Finland's transport strategy

- Rationale: The transport system is in transition and its balance is changed by the increasing competition, changing norms and reducing public sector resources. The role of **the public sector** diminishes and **becomes an enabler**. Citizens and businesses become more active as developers of the transport system.
- Objective: The aim is to improve the cost-effectiveness of the most important transport areas and to facilitate the mobility and travel of everyday life. Spearhead measures are **the safeguarding** of the traffic safety of roads that are important for **raw material transport** and new versatile transport services for everyday travel.
- Challenges: Long distances and decentralized territorial structure cause challenges for organisation of long-distance public transport services; decreasing state funding for public transport increases municipalities' responsibility of funding; with current funding, the **traffic paths are getting worse** at a faster rate; at the same time **ever-increasing transport units** set demands for the burden of paths and bridges.

East Finland's transport strategy: main goals

- Moving and transporting is safe
- **Industry transport chains are cost-effective**
 - Developing a road network where the use of HCT trucks (oversized) is economically advantageous to organize
- There are realistic options for satisfying the needs of mobility
 - Promoting competition in rail and water transport
 - Promote the realization of railway and railway yard projects
 - Promote investment in Saimaa channel
- Logistics cooperation supports efficiency and achievement of synergies
 - **Developing logistics cooperation** and expertise for SMEs.
- Travel time for long-distance transport is predictable
 - Planned new land use is organised in a way that local transport does not undermine the flow of transport on the main roads.
 - Promote the realization of the spearhead projects of the main network

Transport system plan of Päijät-Häme region 2014

- Background: not all goals of the previous transport system plan (2006) were achieved, **highways** operate as a backbone of the road network and **are congested at times, the goods transported** in the region is concentrated **on the road network**, most of the rail freight traffic is only passing through.
- State of the art: **The logistical position** of the region adds value to the business sector's competitiveness, in road transport, the increase in speed and punctuality requirements and the reduction in delivery rates underline the **need for smooth road connections**
 - However: The state and maintenance level of lower road network are worse than that of the main road network; **fragmentation of logistics** and **scarce flow of goods increase transport costs**; in rail freight transport, the importance of rail transport is low regarding the region's outbound transport; in freight transport, the importance of waterborne transport is minimal

Transport system plan of Päijät-Häme region 2014

- Objectives of the transport system plan
 - Ensuring cost-effective and punctual transport throughout the year and **strengthening** the competitive advantage of the **region's good logistical location** for business
 - **Reducing** greenhouse gas emissions from transport and other adverse **environmental impacts of transport** (noise, vibration and groundwater contamination)
 - Improving the economy and efficiency of fairway and transport services - new capacity will be build carefully
 - Improving accessibility
 - Inadequate capacity and weak state of the railway network significantly slow down the transition of transport of goods to rail. Thus excessive shortage of existing low-frequency lines will need to be corrected and sufficient capacity ensured in more traffic-rich lines.
 - **Logistics functions should be concentrated** on areas that are large enough and have good connections to the road and rail network
 - It would be reasonable to concentrate on the development of one or two competitive logistics centers instead of diversifying resources across several different projects

Smart Tampere

- City of Tampere has recently launched a new development programme: Smart Tampere.
- The programme represents means for building a smart and sustainable city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness.
- The programme is built on seven themes of which one is **smart mobility** with the objective of creating an internationally recognised testing and innovation ground of smart traffic.
- A concrete example of this is the trial runs of driverless robot buses. The trial runs in Tampere are a direct follow-up from trials previously conducted in Hernesaari, Helsinki and Otaniemi, Espoo. These trials are a significant step towards **promoting automatic driving both in Finland and globally.**