



# The state of transport and the near-term vision of the transport system

The state of transport can be assessed from the perspectives of the actual and anticipated situations. Our aim here is to illustrate the current state of transport through figures and to present a few perspectives on the future.

We selected the year 2030 as our year of projection; while this is not very far off, it feels like the distant future.

Predicting the future is always challenging, but it is nonetheless a useful exercise as it helps us to understand the long-term consequences of the decisions we make today.

What is certain is that, in the future, new ways of thinking will be needed or at least prove useful. This will be true whether we are examining the service markets in shipping as a global phenomenon, crossing traditional boundaries in transport information services by tapping

into big data, or anticipating the paradigm shift between car ownership and choosing our means of transport based on the current situation.

The role of Trafi is to support, inspire and encourage all operators in the Finnish transport infrastructure to work towards safer, more fluent and sustainable traffic now as well as in the future. Here, we present a number of scenarios created by the director generals of our five transport sectors, which may become reality sooner than we think. We approach these issues holistically and from the perspective of the five transport sectors.



**Kari Wihlman**  
Director General

**Our vision for the state of transport in 2030 is based on interviews with the director generals of the transport sectors within Trafi:**

**Pekka Henttu**, Director General of Civil Aviation

**Yrjö Mäkelä**, Director General, Rail Transport Sector

**Juha Kenraali**, Director General,

**Tuomas Routa**, Director General, Maritime Sector

**Marko Sillanpää**, Director General of Road Transport

Data and Knowledge





## Bold innovations will bring a competitive edge in 2030

Maintaining the future competitiveness of the Finnish transport system depends largely on individual operators. New approaches that shake up old, fixed ways of doing things will encourage operators to venture into new territory; like today, success in 2030 will very much depend on attitude. Trafi will have worked hard to remove obstacles to business activities and will have enabled development from a regulatory standpoint.

The development of maritime transport will be deeply interlinked with the development of global trade. The State will place no administrative limitations on business operations and, by 2030, market mechanisms will have led to the discovery of the most efficient practices. The Finnish shipping industry will be making the most of the global scenario opened up by digitalisation, even in the most traditional freight services. Thanks to this insight, the Finnish maritime sector will have gained a new edge in worldwide competition and the global maritime transport markets will be providing an opportunity for new growth.



However, this will require a strong drive to develop and the setting of goals with a scope that goes beyond merely getting by on a daily basis. Geographically, the focus will shift away from Finland; this wider perspective will open up new opportunities for improved competitiveness on the global transport services markets, as well as in other parts of the maritime sector. Our ice-breaking capacity will increase, allowing our maritime sector, as part of our wider transport system, to offer competitive services around the year.

In aviation, safety and sustainability will have a key position in guaranteeing the success of Finnish aviation in the 2030s. Access within as well as to and from Finland will be recognised as an indispensable factor in our competitiveness. On a domestic level, all aviation operators will work towards a shared goal within their own roles.



Aviation has served as a prime example of a market with a high degree of freedom, but in the Europe of the 2030s, it will have been necessary to place certain restrictions on air traffic from outside Europe in order to maintain competitiveness. Market-oriented air services will be supported by the authorities, which will have an enabling role and establish the framework conditions for operations as necessary.

Rail transport will have identified its natural strengths, and investments will be made in passenger and freight transport services as part of the overall transport system.

Logistic chains will be built around customer needs, and passenger and freight transport volumes will have continued their upward trend. Rail traffic will not, however, be based on free supply, as is the case in other transport sectors; instead, new rail service providers will have been introduced through competitive tendering. In addition to national rail routes, local rail services will have emerged outside the Helsinki metropolitan area, all being based on competitive tendering.





Pilot schemes in road transport will have paved the way for Finnish companies entering the international markets and automation will have expanded the scope of the business opportunities offered by road transport. Experimenting with forward-thinking innovations on the domestic market will play a crucial role in this. Finnish ICT know-how will have provided clear benefits for automated transport.

Companies able to commercialise transport data will have succeeded in creating markets for new services. This will no longer be a question of simply integrating transport and transport system data, but will encompass big data in its entirety. Extracting data for beneficial purposes will be easy and simple, which will support and enable the provision of new, competitive services.





Trafı's data is used in more than

**150** services

Agreement on data utilisation with **70** partners



estimated turnover

**100** million euros



employment for

**330** persons



International market potential for self-steering vehicles and intelligent transport

**3 400** billion euros

## FLEET STATISTICS (2015)



Merchant fleet

**702**



Watercraft

**201 278**



Vehicles in traffic

**5 021 111**



Railway rolling stock

**11 757**



Aircraft

**1 496**

Scrapping bonus trial brought **8 000** new low-emission cars into traffic

## Digitalisation 2030

Digitalisation will permeate the entire transport system. Transport sectors were previously at different stages of digital evolution, but by 2030 these development paths will have converged, crossing sectoral boundaries and sharing best practices.

Digitalisation will support security in a number of respects. In aviation, full automation will long have been commonplace in the safety automation architecture, with human operators merely ensuring smooth operation.

In heavy aircraft, preparations will be underway to dispense with two-pilot crews in order to improve profitability. Following the introduction of unmanned aircraft, automation adopted from aviation will be an integral element in other transport sectors in the 2030s.

In 2030, certain sea routes will be operated by automated vessels, although most vessels will still be manned. Automation will have enabled safer seafaring and will have alleviated the anticipated shortage in skilled seafarers, as the volume of sea transport increases globally. A Pan-European maritime reporting system will have enabled one-off reporting and effortless communication between vessels, ports and authorities. International logistics chains will be efficient and rapid.

The Internet of Things will have enabled automatic transport, even in transport sectors which were previously facing challenges in introducing automated applications. In rail traffic, digitalisation will have been introduced long ago and this trend will continue. Automatic train operation systems, which were previously used on closed rail lines only, will have been introduced in transport in general. Automation in road transport will have moved forward in leaps and bounds, with systems being able to identify objects and other road users and data being transmitted more efficiently than ever. Not only will cars be communicating with each other, but trains will be able to alert cars of their approach at level crossings.



Digitalisation in road transport will have enabled a shift in focus from ownership to the use of vehicles. As freedom of choice increases, people will select their chosen method of transport from a range of available options, such as various on-demand services. Automation will have made transport more equal – the choice of vehicle or freedom of movement will no longer depend on holding certain driving rights.

Using traffic data and integrating it with other data will have made transport services a central element in

everyday life management. Road sections with no traffic signs or traffic lights will have been introduced, with instantly adaptable traffic signs projected onto a virtual map.

Data and its applications will enable both mobility and immobility. Travelling will no longer be a necessity but a choice. In 2030, traffic as such will be more about the movement of information than physical movement from one place to another.



Number of RPAS devices

**1200**  
(2016)



RPAS operators

**800**  
(2016)



Experiments with automated vehicles

**2**  
(2016)



Downloads of Trafi's open data

**300**  
billion data rows (2015)



Data releases

**800**  
million data units (2015)



Users of Trafi's information systems

**40 000**  
(2016)



Trafi's e-services used **872 777** times (2015)

## Towards smart regulation

Transport data forms a basis for piloting various innovations, and as a rule, legislation in the 2030s will be experiment and evidence-based. In road transport, only regulations that are genuinely necessary will have been retained. In the maritime sector, global mobility will require regulation, but such regulation will be as agile and efficient as possible. Finland will have remained in the vanguard of development, with the support of legislation and its practical applications.

In aviation, the significance of policy-making will have substantially increased by the 2030s. The role of agreements will not, however, be to restrict but to support operations. The future of aviation does not lie in strong regulatory control. Air traffic will be based on a new approach, in which authorities set framework conditions as necessary.

In rail transport, the public authorities will continue to be in charge of securing the safe use of the rail network, even in 2030. Deregulation will not affect the safety of rail travel, since responsibility for safety and security will be distributed, on a managed basis, to train operating companies and rail network managers. As in aviation, the regulation of rail traffic will focus on providing an operational framework, within which operators can develop the practices best suited to their services.



**Sulphur emissions from vessels  
reduced in the Baltic Sea**

**88%** (2015)



**Particle emissions from vessels  
reduced in the Baltic Sea**

**36%** (2015)

## PORT STATE CONTROL (2015)

Port state control inspections of foreign vessels in Finland

Inspections

**292**

Inspections leading to findings

**65**

Port state control inspections carried out on Finnish vessels

Inspections

**139**

Inspections leading to findings

**46**

Detentions

**0**

## LICENCES AND CERTIFICATES (2015)



Driving licences

**3.7** million



Seafarers' certificates

**51 000**



Aviation licences

**7 400**



Railway staff qualifications

**1 100**

## INSPECTIONS (2015)



Ship surveys

**1 225**



Passenger car inspections

**2 247 014**



Aircraft inspections

**856**

Licensed vehicle inspection sites

**472**

## Goods must move, but people will only move if they want to

In 2030, there will be much less emphasis on whether or not people travel physically from one place to another, as long as data keeps moving. The most successful transport sectors and methods will be those that can respond to people's mobility needs in qualitative terms.

Sea travel will increasingly focus on leisure travel and the key reason for passenger transport will be entertainment rather than obligatory travel. The overall tonnage will still

include old vessels, but the vessels of the 2030s will operate on LNG and other more environmentally friendly fuels, which will be in plentiful supply. Shipping on the Baltic will mainly consist of frequent container feeder traffic, which forms a link in wider consumer logistics and industrial production chains, with Finland as one of the major players.

Similarly, in rail traffic leisure travel will have acquired new forms, and services such as those focusing on the travel experience and its quality will have growing potential. In general, rail traffic will have responded widely to new types of travel needs and the customer perspective will have been adopted as a key factor alongside profitability when planning service frequencies and stops. Rail traffic will grow in importance both between and within growth centres. The City Rail Loop in Helsinki and a number of new projects for straightening rail lines will be underway. Rail traffic between Helsinki and Tallinn will be under serious consideration, with scenarios including a dual-track railway line for both Finnish and continental track gauges, which will allow high-speed trains bound for Central Europe to depart from Helsinki.



## FATALITIES IN ACCIDENTS (2015)

Aviation

0

Road traffic

266

- 59% in cars
- 12% pedestrians
- 11% cyclists
- 8% bikers

Water traffic

40

- 21 motor boat
- 16 rowing boat/dinghy
- 1 inflatable boat
- 1 windsurfing board
- 1 water scooter

Rail traffic

7

- 6 at level crossings
- 1 on track without permission

## INJURIES IN ACCIDENTS (2015)

Road traffic

6 385

- 53% in cars
- 13% cyclists
- 10% mopedists
- 8% bikers

Rail traffic (Seriously injured)

7

- 5 at level crossings
- 1 on track without permission
- 1 worker



## RAIL ACCIDENTS (2015)

Level crossing accidents

10

Fatalities/injuries from accidents caused by rolling stock in traffic

2

Other accidents

1



## MARINE ACCIDENTS (2015)

Accidents to Finnish vessels

29

Accidents in Finnish territorial waters

34

Accidents to pleasure craft

1 862



Collaboration on goods transport, both within the rail transport sector and with other sectors, will be smooth and the range of services will be growing. Railways will be the main method of long-distance, high volume and heavy transport in particular. The most interesting destination for goods transport will be towards the east and Asia.

By the 2030s, the role of aviation in the Finnish transport system will have increased and Finland will be easily accessible by air. The main emphasis in aviation will be on passenger transport, since flying will have proven to be a safe, inexpensive and reliable form of transport.

In road transport, major progress will have been made in automation, which will assist the transport of people and goods. Goods transport by road will be increasingly automated as the 2030s draw near, with truck platooning commonplace on the roads. Only short distances will be covered by passenger cars, a large number of which will be emission free. Efficient markets will have been created for pooled cars and the focus will have shifted from private ownership of cars to their use. There will have been a mass switch to public transport and cycling and environmental measures will have resulted in various regulations, including a ban on studded winter tyres in Helsinki city centre.

The key change in transport will be due to data and its applications, which will have helped to reduce obligatory travel. Travelling from one place to another will be more of an option than a necessity, and will mainly occur during leisure time. No one will be forced to travel and traffic will also be 'virtual'.

Road accident fatalities will have virtually been eliminated by 2030.



## AVIATION ACCIDENTS (2015)

### COMMERCIAL AVIATION

accidents

1

serious incidents

8

### GENERAL AVIATION

accidents

2

serious incidents

6

### SPORT AVIATION

accidents

11

serious incidents

9

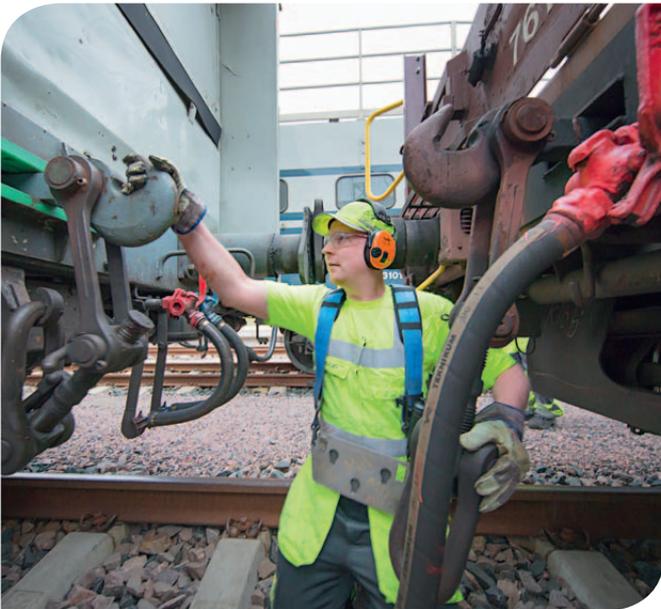


## Synergies between transport sectors in 2030

In 2030, the Finnish transport system will be characterised by seamless and voluntary collaboration between operators crossing traditional sectoral boundaries. In our ever-changing world, collaboration will have become more important than ever. Threats, competitors and stakeholders will have been redefined. Operators within the transport system will have noticed that supporting other operators, regardless of the sector they represent, is more beneficial than competing with them, as this will secure a much larger share of the global market for Finnish operators.

In aviation, the EU will provide a framework for maintaining competitiveness in the sector. One issue under consideration will be the creation of barriers between Europe and the rest of the world, in order to maintain the competitiveness of European aviation in 2030 and beyond. By 2030, all aviation operators will have recognised their role in achieving over-arching objectives and conflicts of interest within the industry will have been resolved, with the resulting compromise benefiting all aviation industry operators and society at large.

In rail transport, Trafi will serve as Finland's proponent in Europe, to help prevent the emergence of unhealthy structures. Collaboration schemes will have been created within rail services following the deregulation of rail traffic, and domestic medium-distance rail transport will have resumed. From the perspective of the transport system, the winners in this scenario will first and foremost be the customers, thanks to improved and more varied services and closer collaboration within and between different transport sectors.





Globalisation and the evolving markets will have encouraged Finnish maritime operators to take advantage of new opportunities. Through close collaboration, the sector will have enabled the Finnish maritime cluster to succeed against the global competition as we enter the 2030s. Trafi will serve Finland's national interests in the wide sector of international shipping.

By 2030, the expansion of transport data and, more generally, the availability of big data will have made a major impact. Trafi will have worked towards centralising transport data, bringing together the parties involved in data management and inspiring them to continue making progress. A good example of this will be the Traffic Lab, which by 2030 will have created an innovative, digital transport pilot testing ground covering the whole of Finland.

The use of analytics will bring about major potential. Services based on data will be valuable, rather than the data itself. The authorities will serve, in part, as trend setters in applying data and in helping to build an overall picture serving the common interest rather than benefiting individual operators. Operators will be open to sharing their data reserves for the common good, which will be beneficial to initial business operations as well as leading to the creation of something new. We will no longer limit ourselves to combining data on transport or transport systems, as we will have gained access to big data in its entirety. At the same time, services will be becoming more tailored.

The transport system will be an inseparable part of society, and the use of data will become the leading trend in all transport sectors.





Average age of passenger cars

**11.3** years

(2015)



Scrapping age of passenger cars

**20.1** years

(2015)



CO<sub>2</sub> emissions from passenger cars,  
first registration

**120.8** g/km

(2016)



Share of cars using  
alternative fuels  
in first registrations

**1.2** %

(2016)

Share of electric traction in train-kilometres driven



passenger traffic

**93.3%**

(2015)



freight traffic

**74.3%**

(2015)

## NOISE



Persons exposed to road and street noise (2011)

**785 000-885 000**



Persons exposed to aircraft noise (2011)

**25 000**



Persons exposed to noise from Helsinki Airport  
(2015)

**18 600**



Persons exposed to night-time noise from rail traffic  
(2011)

**110 000**



# Trafi

**Finnish Transport Safety Agency**

P.O.Box 320, FI-00101 Helsinki

Tel.: +358 29 534 5000

Fax: +358 29 534 5095

[www.trafi.fi](http://www.trafi.fi)

[twitter.com/Trafi\\_Finland](https://twitter.com/Trafi_Finland)

[www.facebook.com/Trafi.Finland](https://www.facebook.com/Trafi.Finland)