

# Logistics digitalisation strategy

## Appendix

## Description sheet

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<b>Abstract</b> <p>On 20 August 2019, a project was set up at the Ministry of Transport and Communications to promote a more strategic approach to logistics digitalisation. The purpose of the strategy is to steer future policy measures in relation to the digitalisation of logistics and the digitalisation of the business environment in the logistics sector. The aim of the strategy is both to accelerate the digitalisation process in the logistics sector and to achieve efficiency, security and sustainability benefits through logistics digitalisation. In addition to the vision and strategy, also proposals for key measures are included.</p> <p>An essential element of the strategy is that the infrastructure, logistics and data will form a functional package. The vision of the strategy is to move towards efficient and sustainable logistics by means of digitalisation. The current pandemic has shown that a permanent digital transition will bring resilience and predictability. It will also improve global competitiveness and the opportunities to respond to the climate challenge.</p>			
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# 1 Strategy vision and objectives

## 1.1 Vision 2032

**Infrastructure, logistics and data form a functional package in the transport corridors. Digital transformation has moved Finland towards efficient and sustainable logistics.**

### **Equal and efficient digital transport chains**

The effectiveness, security and sustainability of logistics in Finland ranks among the highest in the world thanks to the utilisation of digitalisation. All enterprises regardless of size and type can make use of the available data when building innovations and digital solutions.

Actors of all sizes and types – data providers, utilisers and users alike – have equal access to data. Both small and large enterprises have the capacities to seize new opportunities via open interfaces. Enterprises have an equal playing field in providing services to end users and both enterprises and end users are in a position to obtain competitive bids from service providers. Data providers are given a chance to provide data via interfaces. Support tools to make the operations of small actors easier and more efficient and to facilitate systems integration can be created for the utilisation of interface solutions.

## **Data flows in national and international corridors and nodes**

The logistics sector is a pioneer in utilising the potential of digitalisation and the data economy. Data is made better utilisable to allow enterprises to create new operating models and to make data flow more efficiently throughout the transport chain. Digital transport data is of high quality, available in real time and interoperable both among enterprises and between enterprises and the competent authorities. The framework for efficient multimodal cross-border digital data sharing is provided through legislation and networked cooperation.

## **Reducing the climate impacts of logistics through greater efficiency, optimisation and streamlining**

Improving the currency of data and streamlining transports can help eliminate unnecessary steps and thus deliver environmental benefits. Border crossings and transfers between modes of transport work smoothly. A distributed data sharing infrastructure has enhanced the availability and currency of data among logistics operators. Freight transports and the operations of nodes such as ports and terminals, air cargo terminals included, are optimised to boost loading rate and capacity utilisation rate and to shorten handling times. Real-time data provided in the transport network is utilised to streamline transports and for planning so as to reduce disruptions and make the transport chains function as predictably and smoothly as possible.

## **1.2 Objectives**

The three objectives key to the achievement of the vision are:

### **1. Enhancing the sharing, utilisation and provision of data throughout the transport chain**

Data management and utilisation throughout the supply chain stand at the core of logistics. Data flows and data sharing must be of high quality and all information must be transparent. Data must flow in real time to allow better planning and proactiveness in operations. All operations must aim for a higher degree of automated digital data transfer where the different data systems are in direct communication with each other. A considerable part of digitalisation development focuses on this particular aspect. Various kinds of digital solutions are constantly being developed in relation to matters such as fuel economy, consumption and travel cost optimisation, which make a difference to emissions reduction. Data sharing must be enhanced throughout the transport chain and this may involve supporting tools that require better utilisation of data.

Emissions reduction potential can be tapped through overall streamlining and greater efficiency of operations by means of e.g. better time data management. In maritime transport, a report of the Finnish Transport and Communications Agency Traficom identified platform-based data sharing throughout the transport chain, combined with machine learning algorithms and predictive analytics, as a tool for reducing emissions<sup>1</sup>. Road transport emissions at ports can in turn be reduced by ensuring that transport vehicles are not required to spend time unnecessarily at the port. A slot-booking system, for example, allows trucks to book in advance a time slot for container pickup at the port. The system seeks to reduce congestion and idling in order to reduce emissions. Emissions reductions could be achieved by optimising cargo transport capacity, ships' sea voyages and cargo handling at ports.

### *Data flows in corridors*

The transport networks must be used efficiently and transport capacity and resources are utilised with the aid of data sharing. Legislation imposes no obligation to use paper documents in transport chains and electronic transport data is used when interacting with the authorities. Transport data must be in digital, machine readable format. It must also be available in real time, interoperable, accurate and up to date. Data delivery must take place in a distributed manner via open and interoperable interfaces by means of a solution that is as technology-neutral as possible.

Data utilisation must improve safety by fostering a smooth and anticipatory approach, which enables steady, safe and climate-friendly travel speeds, increases security of supply and safety, and allows smooth transfers between modes of transport. The real-time nature of the data must also allow enterprises to make decisions on the basis of up-to-date data. An example of this can be found in the speedy transport of general cargo and packages, where optimisation requires advance data of the highest standard.

Finland's competitiveness must be enhanced and all data that flows in the transport chain and makes it function more smoothly must be utilised. This also includes tacit knowledge of efficient job performance, which includes elements such as experience-based knowledge. A shared vision and strategic intent must be formulated in order to build trust.

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<sup>1</sup> Finnish Transport and Communications Agency Traficom 2019. Utilising digitalisation to reduce emissions in maritime transport

*Enhancing capacity utilisation rate and loading rate*

The capacity utilisation rate and loading rate in transport must be raised with the aid of digitalisation. Reducing empty runs requires, among other things, extensive use of freight exchange solutions such as freight agency services and joint deliveries in cities. More efficient transport chains may serve to improve average fuel economy. A similar impact on average fuel economy is estimated to be achievable through the automation of transport vehicles and backend systems. In 2018, trucks operated transport journeys totalling 1.9 billion kilometres in length and the loading rate was 71%, according to Statistics Finland. The capacity utilisation rate in goods transport is estimated to be around 57%. Digitalisation can provide the tools to raise the capacity utilisation rate through freight consolidation. Although the technology required for freight consolidation has been available for quite some time, to date there has nonetheless been little change in the volume of empty runs<sup>2</sup>.

*Distributed data sharing infrastructure*

Data sharing must be based on distributed systems. This way, data need only be recorded in a single system, and it also enables the availability of the tools for processing the data. Going forward, instead of data having to be transferred or copied, it should be possible to utilise data by means of open and interoperable interfaces (Application Programming Interfaces or API). Of course, this does not mean that all data would be available to everyone. Different roles and needs for data can be distinguished (for example authorities – business partners – other private actors – universally open data). The operating model and specifications must also promote higher data quality and traceability. In some cases, it may become necessary to assess the need to impose an obligation to share data or information derived from data via interfaces.

**2. Developing a knowledge base of high quality**

The knowledge base and the utilisation of data must be developed to provide actors with the right and a genuine opportunity to make use of their own data. Situations where a single actor comes to hold an excessively dominant position in data sharing and consequently throughout the service business must be avoided. Capitalising on new operating models and technologies should also improve business conditions for enterprises and provide better employment opportunities. A level playing field must be

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<sup>2</sup> Liimatainen, H. & Viri, R., 2017. Liikenteen päästötavoitteiden saavuttaminen 2030 – politiikkatoimenpiteiden tarkastelu [Achievement of transport emission targets 2030 – review of policy measures]: The Finnish Climate Change Panel.

put in place for enterprises of different sizes and types, which also serves to combat the grey economy.

We must create a real-time economy where financial transactions are based on digital data and its processing and where the data on electronic receipts and invoices can be utilised in the logistics chain. This will enhance aspects such as productivity growth in enterprises and government and will thus promote the sustainability and competitiveness of society and its sectors. The systems and data used must be based on open standards or source code that, with regard to international logistics chains in particular, must be internationally accepted, and non-discriminatory access to these must be provided.

### **3. Potential of people and enterprises to influence their carbon footprint**

The various actors in the transport chain must have access to the monitoring data needed to assess the climate impacts of their operations. Primarily, this should be catered for through contracts between enterprises and, when necessary and as a measure of last resort, through legislation. Monitoring and data of the emissions must be available and an internationally accepted calculation method must have been developed from sender to recipient and all the way onward to the end user. This may allow maximally real-time delivery tracking and emissions monitoring as well as the tailoring of the service according to the choices of the customer or the client. The carrier enterprises as well as the enterprises that send and receive freight must have the requisite emissions indicators, which facilitates freight consolidation. Support in this can be obtained from centres designed for consolidating deliveries in local logistics, which would allow the consolidation of freight going in the same direction. Operations on market terms and a diverse range of services must be promoted in order to provide enterprises and people with options to choose from on the basis of considerations such as emissions.

#### *Positive impacts on work and employment*

The logistics sector needs to modernise and enhance its competitiveness, thus creating opportunities to employ and to attract new employees. New operating models and technologies must bring about change also in the ways of working towards ones that make use of digital solutions. Digitalisation must improve the meaningfulness and efficiency of work. The predictability of work stages increases, the opportunities for work organisation grow, and the number of arduous work phases decreases. Transport chain management must be improved and the number of errors brought down, which will have an impact on the service level perceived by the end user and client as well as their competitiveness. People must have an equal opportunity to find employment in the sector also by means of digital platforms.



### *Capacity to utilise digital solutions*

The logistics sector must be able to attract talent and enterprises must have access to a pool of labour capable of utilising and developing digital solutions. Actors in the sector must possess a high level of the expertise required for digitalisation. The expertise and understanding of enterprises in utilising digitalisation must have been strengthened, for example to enable services and business models based on digital solutions and data utilisation. Moreover, new solutions and innovations must be scalable from Finland to the international market.

## 2 Strategy measures

### a. Logistics data environment development

- Situational picture data, estimated time of arrival included, will be developed by increasing the availability and interoperability of digital data among the various logistics actors throughout the transport chain with the aim of making transport smoother and more efficient. Particular attention will be paid to the availability of data on arrival and departure times at nodes (ports, terminals, airports).
- A framework will be created for the operation of freight exchange platforms and services, with attention paid to cybersecurity, and the principles, processes and roles of data sharing and utilisation will be determined in cooperation with the actors as a part of the implementation of the EU requirements concerning electronic freight transfer information (eFTI) and port notifications<sup>3</sup>. The measures under the EU Data Strategy will be taken into account in the development efforts.
- The roles and responsibilities of data providers and utilisers as well as intermediate data transfer parties will be defined. The development efforts in the EU concerning a data sharing management model will be taken into account.
- The availability of data on dangerous goods in the transport chains and its accessibility to the authorities will be improved.

Transport chains will be made to function more smoothly and efficiently by enhancing data utilisation, and actors of different sizes and types must be provided with an equal playing field and the right of access to the data. At present, data is distributed among multiple actors and functions, which means that decision-making power is also distributed. This, in turn, poses a challenge in obtaining an overall picture of e.g. emissions over the entire transport chain of a product.

The sector has recognised the need for a platform for integrating the distributed data stores and services. It must additionally be ensured that such platforms can be utilised by actors of different sizes and types. The availability and quality of data are not,

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<sup>3</sup> EU legislation will impose minimum requirements on building digital services supportive of online data services:

- port notifications in maritime transport, EMSW Regulation: By August 2025, EU Member States (coastal States) shall have in use a National Single Window for handling reporting formalities relating to ships' port calls (customs notifications included).
- electronic freight transfer information, eFTI: Requires the authorities to accept freight information in standard digital format. Execution of the system includes agreeing on implementation measures at the level of the EU and organising certification.

in all respects, at a level that would permit the desired overall efficiency to be achieved. The correctness of the data (spatial and address data included) should be ensured already at the source to ensure quality, reliability and availability.

Capitalising on new approaches and technologies will also improve business conditions for enterprises and provide better employment opportunities. Digital solutions underscore the greater efficiency of the entire delivery chain in which shipping is a vital link; the vast majority of goods flows in Finland's foreign trade are carried by ship. Moreover, digital solutions are constantly being developed in the design, navigation and operations of ships. Machine-readable and machine-processable data also provides the foundation for automation technology.

Digitalisation provides a framework that would enable port automation, yet when flows of goods are low, the costs of automation investment rise too high. Other means to achieve greater efficiency must therefore also sought through digitalisation. According to a survey by the working group on port call data under the direction of the Finnish Transport and Communications Agency Traficom, the operations of the entire port would be facilitated if up-to-date and high-quality ship arrival and departure time data was communicated to all parties concerned.

#### b. Enabling legislation

- A framework to provide transport chain actors with access to monitoring data necessary for assessing the climate impacts of their operations will be created, when necessary by legislation ensuring global interoperability.
- The framework for efficient multimodal cross-border digital data sharing must be provided through legislation and networked cooperation. Where necessary, the right of actors to access data that is central to their own operations must be strengthened through legislation.
- Monitoring and emissions data in the transport chain must be available from sender to recipient and further on all the way to the end user to make the monitoring and control of e.g. delivery progress and emissions as real-time and predictable as possible. A key factor is harmonising the computational methods in measuring emissions. Obligations to supply data on emissions can be imposed on actors, among enterprises primarily by contractual means and when necessary, by legislation.

Sustainable and efficient logistics requires both physical and digital infrastructure for data to flow smoothly and seamlessly. Situations where a single actor comes to hold an excessively dominant position in data sharing and consequently throughout the service business must be avoided. A level playing field and equal right of access to

data must be put in place for enterprises of different sizes and types. A further aim for promoting data sharing is to enhance controls on the grey economy.

Developing legislation and harmonising data contents will ensure that data flows are enabled on the national, EU and international levels. In addition to advocacy at the EU and international levels, enterprises must reach agreement to develop data sharing. Advocacy at the EU level mainly consists of participation in the Digital Transport and Logistics Forum (DTLF), which aims to build a common vision and roadmap for the digitalisation of transport and logistics at the EU level. Key data contents must be agreed and, where necessary, equal rights to data that is essential to one's own transport chain must be confirmed by law in order for data to be seamlessly utilised in the digitalisation and planning of the entire transport chain and in the development of the transport system.

#### c. Enhancing the availability of monitoring data and compilation of statistics

- The responsibility of clients or end users for emissions and their opportunities to monitor emissions will be increased nationally and, where necessary, through EU-level and international agreements so as to create demand for sustainable solutions and investments.
- The availability and quality of data as well as its repurposing to support better statistics compilation and development and controlling the grey economy will be promoted.
- A framework will be created for obtaining an up-to-date situational picture and statistical data for prediction models in support of optimisation and development of the functioning of the transport system. The utilisation of data on road use available from sensors in the road network and transport vehicles will be enhanced and the currency and geographical coverage of such data will be improved.
- Development of the digital infrastructure will take place as an element of development measures in the physical transport infrastructure. The availability and quality of data required for road maintenance and in the event of disruptions will be improved to advance the needs of deliveries in business in particular.
- The implementation of the strategy will also involve the determination of indicators to assess Finland's logistical competitiveness and productivity in the international operating environment.

With regard to data utilisation, the responsibilities of data providers, intermediaries and utilisers should be clarified, as should also the role of the authorities. All data utilisation should be premised on a market-based approach. The measure includes the digitalisation of key data and the currency and quality of the data. The knowledge base will be developed to make data sufficiently available to allow greater efficiency in

the various transport chains, among other things. The fact that statistics are compiled separately for each mode of transport has been perceived as a challenge, as this makes data on multiple modes unavailable and thus prevents an examination of the transport chains. In addition, the level of the statistics is often coarse-grained, due to which precise data cannot be obtained on e.g. regional road haulage and the goods transport statistics in road transport are sample-based. Statistics may also contain business secrets and consequently e.g. modality-specific statistics provided for statistical compilation and research may be limited in scope.

The nature and scope of the datasets included in the statistics limit the potential for e.g. freight transport modelling. Various kinds of sensors make it possible to obtain increasingly precise load and mass data in freight transport. So far, this data has not been collected or utilised to any great extent, however. Data must also be utilised in risk-based supervision and to allow clients to evaluate the reliability of suppliers.

Data utilisation and the broad availability of data are also vital to maintenance, as data-based timely maintenance promotes transport smoothness and efficiency. This also extends to winter maintenance and cooperation with transport companies in particular, especially with regard to the lower road network and transport by the forest industry and dairy farms. Data on where and when transports take place also allows the optimisation of snow removal.

#### d. Funding and piloting

- A long-spanning development plan of the projects required to utilise logistics data will be prepared, in particular to enhance the efficiency of data flows in transport corridors.
- It will be ensured that the objectives of the logistics digitalisation strategy are catered for in EU funding programmes. The coordination of cooperation necessary for EU funding programmes and the allocation of national funding to projects will be ensured.

The digitalisation of transport and logistics is best promoted by creating economically sustainable business models and value chains based on digital platform operation and data sharing. This will provide enterprises with the opportunity to build operating models that rely on revenues obtainable through investment and innovations based on a competitive market. Specific development measures in cases where equal or market solutions apparently cannot be located are needed in order to eliminate bottlenecks in data sharing or the adoption of digital solutions. In addition, the adoption of data transfer services with regard to e.g. the following areas of development will be promoted in reliance on EU funding (especially DEP Digital Europe Program, CEF2 Digital and Transport, and the Horizon Europe programmes), national funding and

various alliances and networks: ERTMS, Intelligent Transport Services for road (ITS), New technologies and innovation, River Information Services (RIS), Safe and secure infrastructure, Single European Sky – SESAR.

The various networks for sharing information and locating common goals are key in respect of building calls for funding, trials and pilots. Essential networks include the logistics digitalisation network of the Ministry of Transport and Communications and the common open networks of the sector. National and EU legislation must provide an operating environment that enables trials based on data utilisation and digitalisation.

e. **Optimised fleets and capacity in urban logistics**

- Procurement and investment will be steered towards sustainable solutions by increasing the responsibility and rights of clients or through legislation. Funding to fuel and energy efficiency investments will be targeted to the promotion of digital solutions.
- The potential for data utilisation will be improved for the purposes of freight transport optimisation and delivery consolidation.

Better access to data will also enable new approaches in urban logistics to allow line hauled freight to be distributed to electronic vehicles for carriage in short, first and last mile deliveries.

Cities and businesses must work in tandem to promote measures to consolidate and streamline first and last mile deliveries. Greater flexibility must be introduced with regard to the use of smaller delivery vehicles by developing a standardised loading unit also for urban transport (cf. containers in global multimodal transport). The key consideration is to minimise the noise arising from loading and unloading. In addition, a transition to quiet electric vehicles of different sizes in short-distance deliveries would better enable deliveries both in the daytime and at night, as a result of which deliveries would cause less disruption to other traffic. Data on charging locations for loading and electric transport must be available to all in real time. In order to improve the usability of electric vehicles, infrastructure suitable for charging electric vehicles should to a greater extent be built in connection with parking areas for loading and loading zones.

Data sharing solutions making use of urban logistics and data utilisation must be developed to allow the optimisation of transport. The carrier enterprises as well as the enterprises that send and receive freight must be provided with better opportunities for freight consolidation. Support in this can be obtained from centres designed for consolidating deliveries in local logistics and joint-use freight exchanges, which would allow the consolidation of freight going in the same direction. Consumers must also be

provided with an opportunity extensively to make use of distribution centres to receive both goods purchased online and online grocery shopping deliveries. Freedom of choice must be created for enterprises and people by promoting a range of services that is maximally market-based and diverse.

**f. Interoperability in data through cooperation**

- New operating models will be introduced, ways of working will be reformed and cooperation between the actors in the sector and the public sector will be increased.
- In the implementation of eFTI and eMSW Regulations, the operating conditions for an ecosystem of data sharing networks will be ensured.

Logistics is a field where the contributions of numerous parties are required and goods are moved forward via various nodes and by different modes of transport. Decision-making authority is often divided between e.g. the logistics/transport company and the industrial enterprise or transport customer. It is essential to jointly arrive at a strategic intent, set of ground rules, practices and international standardisation and harmonisation efforts to ensure the availability, quality and interoperability of data.