

*Intelligent transport  
systems and services  
Finnish strategy*

JÄMSÄNKOSKI  
15 KEURUU  
20 PEURUNKA  
30 HANKASALMI KK  
45 MIKKELI  
8:50 PIHTIPUDAS  
8:50 KARSTULA  
18:50 HELSINKI  
19:15 UURAINEN

 Tulo- ja lähtölaiturit  
Arrivals Departures



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Luze Oy / Sari Joukainen

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Antero Aaltonen (cover)  
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### ***A strategy towards a common goal of utilising the latest technologies in traffic and transport***

The vision of the Finnish information society and communications policy is a society that utilises the innovations brought about by technological development in order to promote citizens' wellbeing, equality, democracy and international competitiveness. Intelligent Transport Systems and Services (ITS) incorporate the latest information and communications technologies to serve citizens, public authorities and businesses in the context of transport. ITS will help make the transport system safe, efficient, accessible and environmentally friendly.

The objective of this strategy was to explore the methods and resources that should be applied to utilise and implement ITS in the administrative sector of the Ministry of Transport and Communications during the 2004 to 2007 operating and financial planning period. The strategy arises from the transport and information society policies set out in the Government Programme and the Government's Information Society Programme and by the Ministry of Transport and Communications, the European Union and the Finnish transport administrations as well as from the changes in the operating environment and the prospects of technological advancements. The starting point is the current state of ITS in our administrative sector with regard to both services and their organisation. Many of the services that utilise telematics are related to transport, but this strategy focuses on telematics applications specifically designed for transport. Thus a vast majority of logistics telematics and general public applications, including the Finnish public authority communication network VIRVE, are not included in this strategy.

This first strategy in the field of ITS provides a common direction for the various administrative sectors and actors towards the development of ITS in Finland.

Helsinki, 24 August 2004

Leena Luhtanen

Minister of Transport and Communications

Juhani Korpela

Permanent Secretary



## Summary

The Intelligent Transport Systems and Services (ITS) strategy of the Ministry of Transport and Communications arises from the transport and information society policies set out in the Government Programme and the Government's Information Society Programme and by the Ministry of Transport and Communications, the European Union and the transport administrations as well as from the changes in the operating environment and the prospects of technological advancements. The starting point is the current state of ITS in our administrative sector with regard to both services and the organisation of services.

The mission of the administrative sector is that the Ministry of Transport and Communications carries the responsibility for the utilisation of ITS in transport and traffic in cooperation with the transport administrations and other organisations in the sector. The administrative sector is in charge of basic services and systems, develops the necessary facilities for and supports the implementation of ITS necessary for transport.

The vision into 2010 is that the travelling public, businesses and different organisations will have easy access to reliable and relevant information about current and anticipated travel and transport conditions and incidents as well as transport services related to trips and travel chains. The safe, efficient, accessible and environmentally friendly functioning of the transport system will be ensured through the utilisation of ITS.

In 2010, dynamic traffic control systems on the international transport corridors will be operated in real time, and these corridors will have real-time traffic information and incident management systems as well as the monitoring and information systems required. In other parts of the transport system, utilisation of ITS by the administrations will have been acknowledged as an alternative and supplementary measure to other transport system management tools.

Extensive value-added services that are based on user needs and facilitate mobility will have been introduced nationwide, particularly in road traffic and public transport by 2010. ITS will also boost multimodality. ITS functions will ensure smooth and easy transfer of travellers and goods between transport modes at major airports, ports and travel interchanges.

In addition to the general operating principles, the strategy presents the strategic ITS policies of the transport administrations. Objectives set for the ITS development and implementation by the administrations as well as their Action Plans are presented separately.

## Mission



The Ministry of Transport and Communications carries the responsibility for the utilisation of ITS in transport and traffic in cooperation with the administrations and other organisations under its administrative sector. The administrative sector is in charge of basic services and systems and develops the necessary facilities for and supports the implementation of ITS necessary for transport.

ITS help to ensure that the travelling public, businesses and other parties can satisfy their mobility and transport needs by different transport modes as smoothly, safely and efficiently as possible between their points of origin and destinations. ITS are utilised in fields and applications where it is economical, efficient and environmentally sound, and in a manner suitable for Finnish conditions and transport.

The administrative sector of the Ministry of Transport and Communications is responsible for the regulation, prerequisites for service production, basic services and necessary information systems related to ITS. It also cooperates with other administrative sectors and the various organisations in the field as well as the private sector, and supports the development of the services needed.



The Ministry is responsible for ITS policies and ITS deployment as part of the transport policy as well as for regulatory measures supporting these. The transport administrations are responsible for the basic services – traffic control and the supporting traffic information and incident management, the cooperation required by the services and the equal distribution of information in order to create a well-functioning transport system.

Finland is a forerunner in ITS, their utilisation and the provision of ITS based on user needs and designed for northern conditions (northern climate, sparse population, light traffic flows). The implementation and development of the services call for a well-functioning ITS market and good cooperation in service provision between the public and private sector actors involved in Finland.



## ***Vision 2010***

The travelling public, businesses and different organisations will have easy access to reliable and relevant information about current and anticipated travel and transport conditions and incidents as well as transport services related to trips and travel chains.

The safe, efficient, accessible and environmentally friendly functioning of the transport system will be ensured through the utilisation of ITS.

Dynamic traffic control systems in the international transport corridors will be operated in real time, and these corridors will have real-time traffic information and incident management systems as well as the monitoring and information systems required.

In other parts of the transport system, utilisation of ITS by the transport administrations will have been acknowledged as an alternative and supplementary measure to other transport system management tools.

Extensive value-added services that are based on user needs and facilitate mobility will have been introduced nationwide, particularly in road traffic and public transport.

ITS will also boost multimodality. ITS functions will ensure smooth and easy transfer of travellers and goods between transport modes at major airports, ports and public transport interchanges.

For the ***Finnish Civil Aviation Administration***, the key challenges of the vision are related to the smooth transfer of travellers and goods between modes of transport – mainly between road and air transport – and the efficient handling of incidents and provision of information about them.

For the ***Finnish Maritime Administration***, the implementation of the vision entails efforts towards real-time traffic management on the main international routes and towards developing traveller information.

The sections of the vision most challenging to the ***Finnish Rail Administration*** are related to the management of traveller information and incidents as well as the development of the related monitoring systems.

For the ***Finnish Road Administration***, fulfilling the vision requires special input into traffic monitoring, cooperation between public authorities in incident management, dynamic real-time traffic control in transport corridors and creating the preconditions for value-added services.



ITS implementation will be based on user needs and produce benefits for users, businesses and society. ITS will be deployed in a way that efficiently promotes the transport policy objectives.

The administrative sector will focus especially on traffic control and the related activities as well as on developing traveller information and creating the prerequisites for other services. The mass media, radio and television services and information networks (the Internet) will be employed widely in the dissemination of traffic information.

In most cases, individualised services will be wholly or in part commercial. Cooperation between public and private sector actors in service provision will be based on fair and transparent rules and arrangements to facilitate the launch of new services. The private sector will be provided enough scope for profitable business in the production of the services required by the transport system.

The development of the telematics systems will be based on our national telematics architecture retaining the necessary interoperability in accordance with the principles agreed in the EU.

The transport administrations will be responsible for collecting, maintaining and providing easy access to their transport mode's route, timetable, incident and real-time status information to cater for the development of traveller services.

ITS activities will be organised efficiently in the administrative sector, and the necessary competence and its development will be ensured. The utilisation of ITS will be target-oriented and based on plans and schedules. The necessary estimates and allocations regarding the financing needed will have been made. Cooperation between the administrative sector and other organisations will be organised and the responsibilities and liabilities will be decided upon.

The joint research and development activities of the administrative sector will be utilised in the development of ITS applications and systems and the generation of innovations.

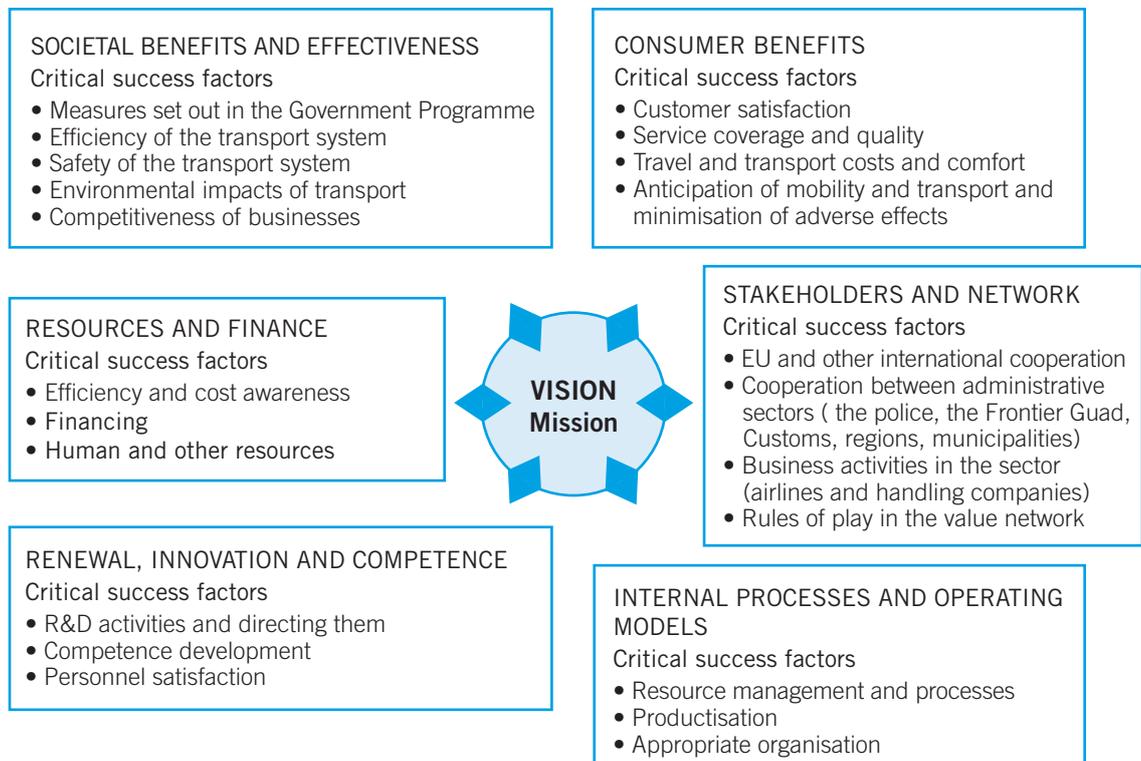
The key policy area of the strategy is catering for the door-to-door travel and transport needs of the public and businesses utilising the transport mode or a combination of modes most appropriate for the prevailing conditions. Furthermore, ITS improve access to the travel chains for all user groups.

Failure to achieve the seamless functioning of intermodal travel and transport chains results in the inefficient functioning of the transport system, and the public and businesses often have to settle for a poor or merely adequate level of transport services. Well-functioning travel and transport chains do, however, require a lot from the transport system and its information infrastructure in particular. The systems for the various transport modes must be interoperable or at least usable through mutually agreed interfaces. The greatest benefits from the seamless chains are likely to be manifested particularly in cases of incidents, as smooth transfers into an incident-free transport mode will materially reduce the adverse effects and costs arising from incidents.

Journeys fully or partly paid for by public authorities will be subject to travel dispatch arrangements in order to make the transport services more efficient and to create cost savings. This will take place through the Travel Dispatch Centres to be established.

The chart below presents the ITS Balanced Scorecard (BSC) framework used in the formulation of this strategy. The framework is based on an early model used by the working group developing transport infrastructure services simultaneously with the strategy process, but it does not fully correspond to the working group's final BSC model.

The Balanced Scorecards can be found in Appendix 2. The following sections present the most significant strategic policies of the BSCs.



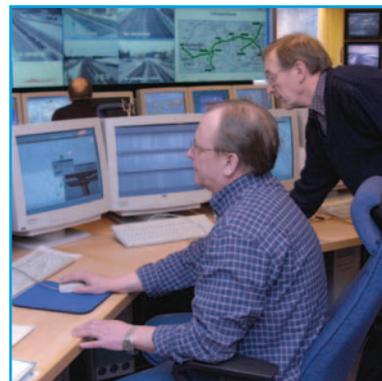
## *Objectives of the transport administrations into 2007*



The Ministry of Transport and Communications and the transport administrations will agree on the specific objectives of the administrations for each year.

Objectives shared by all of the transport administrations include reducing the number of traffic fatalities, developing incident management and other cooperation between authorities, improving the predictability of travel times and reducing delays, providing services that meet user expectations and needs and developing traffic monitoring and its coverage. In addition, the specific objective of the Civil Aviation Administration is to improve customer information and complete the reform of the air navigation service. The objectives of the Maritime Administration also include improving the hydrographic survey data and developing the radio navigation system so that it meets international commitments. The Rail Administration will also work towards the objectives of advancing automation and train control and developing systems to monitor rolling stock, while the Road Administration will seek to implement the basic traffic management services.

The key objectives of the transport administrations regarding stakeholder cooperation are related to coordinating the various transport information systems and developing interfaces between the actors as well as facilitating commercial information and other telematics services and business opportunities in the sector in general.



The objectives regarding internal processes and operating models are largely related to preparedness for changes expected in the near future. The Civil Aviation Administration will focus on process development and the related supporting systems, the Maritime Administration on adopting the client-supplier model, the Rail Administration on operating models that adapt to rail traffic operator competition and the Road Administration on using the methods of traffic management in solving problems with the road network on an equal footing with other road maintenance and development activities.

The objectives related to renewal, innovations and competence mainly apply to ensuring competent and sufficient human resources as well as to research and development. In addition to sufficient human resources, the resource objectives underline the importance of ensuring the financing of ITS activities.



## ***ITS action plan***

According to the plans made by the transport administrations, the most significant ITS implementations and development measures for 2004 to 2007 will be as follows:

### ***Civil Aviation Administration***

- improving the reliability of national data communications
- implementing the air navigation services development programme
- developing the reliability of the baggage management system
- implementing the service database for dynamic timetable information and incorporating it into the public transport information portal
- providing real-time route and timetable information for bus and train connections at airports
- deploying the air transport information system AirportNet and the necessary information system interfaces

### ***Maritime Administration***

- implementing the Navi programme for generating and updating data on sea routes, channel alignments, safety devices and depth soundings as well as the hydrography development programme
- bringing all commercial shipping lanes within the scope of the Vessel Traffic Service (VTS), an active vessel traffic management and monitoring system
- expanding the VTS to the open sea areas of the Gulf of Finland
- completing the creation of the Automatic Identification System (AIS) to cover all commercial shipping routes in Finland and to link the Finnish AIS to the AIS network of HELCOM
- updating the Differential Global Positioning System (DGPS) for areas requiring double coverage
- performing the hydrographic surveys on the critical HELCOM routes specified by the Baltic Marine Environment Protection Commission (HELCOM, the Helsinki Commission)
- providing basic services (waterway maintenance and development, pilotage, icebreaking, hydrographic surveys, hydrography, monitoring maritime safety)
- developing and using the centralised maritime transport information system and other management of maritime transport information

- linking the PortNet system to the EU SafeSeaNet system that is under construction
- maintaining depth and safety device data regarding the national sea route network
- increasing the coverage of vessel positioning and identification
- increasing the coverage of the Electronic Chart Display and Information System (ECDIS) and developing the distribution of updates

### ***Rail Administration***

- implementing the Automatic Train Control (ATC) system (Phase III by the end of 2005)
- renewing the radio system for rail traffic control (GSM-R)
- installing trackside hot box, wheelflat and leak detectors
- automation of traffic control (block signal system and remote control)
- implementing train monitoring on passenger lines and busy freight lines
- extending the centralised traveller information systems to the public transport interchanges
- improving and automating the station announcement systems
- implementing the transport planning and capacity allocation system

### ***Road Administration***

- deploying the real-time traffic status monitoring system on the most significant interurban connections and in major urban areas (Helsinki, Turku, Tampere and Oulu) and intensifying road surface condition monitoring, particularly for improved information services
- providing and maintaining basic traffic management services
- dynamic real-time traffic control at local problem sites, when improving road quality or in connection with new road investments where necessary
- increasing automated enforcement in cooperation with the police to cover another 200 km of road (totalling approximately 800 km in 2005)
- maintaining the National Road and Street Database (Digiroad)
- the national Traffic Management Centres (Helsinki Metropolitan Area, Turku, Tampere, Oulu)
- joint operating models and compatible information systems for different public authorities (municipalities, the police, emergency response centres, the Frontier Guard, Customs)
- alternative routes and related signing for the busiest main roads



## ***Costs and impacts of the measures***

The table below presents the costs arising from the Action Plan for 2004 to 2007 as estimated by the transport administrations. It should be noted that almost all of the Civil Aviation Administration projects are missing from the table because the costs of state-owned companies are regarded as business secrets.

At the end of 2003 it appears that the transport administrations are quite well-prepared for the implementation of the Action Plan, with the exception of the Road Administration, whose plans regarding the implementation of the ITS Action Plan between 2004 and 2007 are approximately 40 million euros short of the financing required to implement the programme in accordance with the policies agreed.

Measures by the Civil Aviation Administration in the field of air navigation services and data communications will promote air traffic safety in order to prevent any accidents in scheduled traffic. In addition, these measures will increase traffic smoothness and minimise incidents. The implementation of the timetable information database, AirportNet, information system interfaces, traveller information and airport route information services will enable easier and quicker transfers of travellers and goods from one transport mode to another and thus increase the efficiency of multimodal travel and transport chains. Furthermore, the measures will make travelling more comfortable.

The main impact of the measures by the Maritime Administration will be improved safety. The Action Programme (VTS, AIS, satellite navigation) will considerably decrease the risk of accidents, particularly in the Gulf of Finland and on commercial shipping routes in general. The development and maintenance of information systems will increase the efficiency of activities by public authorities, multimodal transport chains and logistics functions in general.

The measures by the Rail Administration will focus mainly on improving traffic safety. The implementation of automatic train control, the automation of traffic control and the radio system for rail traffic control can be estimated to cut down by four the number of major train accidents resulting in bodily injuries over a period of ten years. The hot box and leak detectors and station announcements will also alleviate the risk and consequences of accidents. The above safety systems, train monitoring, information management systems, transport planning and capacity allocation system and incident management will intensify the utilisation of the rail network capacity and increase the smoothness and predictability of travel and transport. Information services and incident management will improve traveller opportunities to plan their travel chains, make public transport more attractive and travelling in general more pleasant.

**Costs arising in 2004-2007 from the major ITS implementations and development measures by the transport administrations in accordance with the policies agreed as well as the reserves made in the financial plans of the administrations.**

| Transport Administration under the Ministry of Transport and Communications  | Cost estimate<br>€ million | Financing allocated<br>€ million |
|--|----------------------------|----------------------------------|
| <b>Civil Aviation Administration</b>   |                            |                                  |
| Implementing the service database for dynamic timetable information and incorporating it into the public transport information portal  | 0.11                       | 0.11                             |
| Implementing AirportNet  |                            |                                  |
| Specifying and implementing the information system interfaces required   |                            |                                  |
| Real-time route and timetable information for bus and train connections at airport   | 0.34                       | 0.03                             |
| Route information system for Helsinki-Vantaa Airport   |                            |                                  |
| <b>Total</b>   | <b>0.45</b>                | <b>0.14</b>                      |
| <b>Maritime Administration</b>   |                            |                                  |
| Maintaining, improving and developing satellite navigation on all commercial shipping routes   | 1.45                       | 0.80                             |
| Completing the creation of the Automatic Identification System (AIS) and the software updates  | 0.50                       | 0.30                             |
| Vessel traffic information system  |                            |                                  |
| - PortNet, Maritime Administration; Community funding  | 0.25                       | 0.25                             |
| - PortNet, Maritime Administration; self-financed  | 0.45                       | 0.45                             |
| - PilotNet   | 0.80                       | 0.80                             |
| VTS station maintenance and development projects   | 1.58                       | 1.58                             |
| Other ITS projects (coast radio, environmental measurement sensor network, assessment by consultants, minor ITS projects)  | 1.28                       | 1.28                             |
| Creating a denser network of automated water level gauges  | 0.3                        | -                                |
| <b>Total</b>   | <b>6.61</b>                | <b>5.46</b>                      |
| <b>Rail Administration</b>   |                            |                                  |
| Automation of traffic control  | 50                         | 50                               |
| Access control, ATC Phase III  | 50                         | 50                               |
| Trial use of European ATC  | 3                          | 3                                |
| Radio system for rail traffic control (GSM-R)  | 50                         | 50                               |
| Hot box detectors  | 10                         | 10                               |
| Leak detectors for routes used for hazardous substances  | 2                          | 2                                |
| Rail Traffic Monitoring System   | 1                          | 1                                |
| Information system and databases   | 1                          | 1                                |
| Management/distribution of real-time rail traffic information  | 1                          | 1                                |
| Centralised travel information system for travel interchanges  | 5                          | 5                                |
| Improving the station information systems  | 1                          | 1                                |
| Signposting to warn about fast trains (200km/h)  | 3                          | 3                                |
| Transport planning and capacity allocation system  | 5                          | 5                                |
| System interfaces required   | 1                          | 1                                |
| Public transport incident management in the Helsinki Metropolitan Area   | 2                          | 2                                |
| Implementing the continuous R&D programme  | 1                          | 1                                |
| Planning the second-generation automation  | 0.5                        | 0.5                              |
| Mapping the need for targeted investments in control   | 0.5                        | 0.5                              |
| Cost-effective methods   | 0.5                        | 0.5                              |
| <b>Total</b>   | <b>187.5</b>               | <b>187.5</b>                     |
| <b>Road Administration</b>   |                            |                                  |
| Deploying the real-time traffic status monitoring system on the most significant interurban connections and in major urban areas (Helsinki, Turku, Tampere and Oulu) and enhancing road surface condition monitoring, particularly for improved information services | 12                         | 1                                |
| Providing and maintaining the current basic traffic management services  | 40.92                      | 34.76                            |
| Dynamic real-time traffic control at local problem sites, when improving road quality or in connection with new road investments where necessary   | 19.6                       | 2                                |
| Increasing automated enforcement in cooperation with the police to cover another 200 km of road (situation in relation to the overall target of 800 km in autumn 2003)   | 0.64                       | 0.64                             |
| Maintaining the National Road and Street Database (Digiroad)   | 4.8                        | 4.8                              |
| Regional Travel Management Centres (Helsinki Metropolitan Area, Turku, Tampere, Oulu)  | 3                          | -                                |
| Joint operating models and compatible information system for different public authorities (municipalities, the police, emergency response centres, the Frontier Guard, Customs)  | 1                          | -                                |
| Alternative routes and related signing for the busiest main roads  | 3                          | 3                                |
| <b>Total</b>   | <b>84.96</b>               | <b>43.2</b>                      |



Implementing automated enforcement and dynamic traffic control to the extent planned under the Road Administration Action Plan will cut down the annual number of accidents resulting in bodily injury by approximately 25. Urban traffic management centres and signposting for alternative routes on main roads will significantly improve the functioning of the transport network during incidents. Dynamic traffic control and traffic information enabled by the real-time monitoring system will make traffic smoother by impacting driving speed, route selection and travel decisions and especially by increasing the predictability of travel and transport, which is important for private persons and particularly for businesses. The Traffic Management Centres and especially Digiroad and the real-time monitoring system will promote private sector service creation and the efficiency and comfort benefits produced by these services. Such indirect benefits can be estimated to be at least five times greater than the investments involved in producing them.

If the Road Administration's Action Plan will only be implemented within the scope of the current budgetary reserves allocated for the purpose, the only aforementioned impacts to be realised are those of automated enforcement and Digiroad. Consequently, the vast majority of the impacts of the programme will not be achieved in road traffic.



The annual net savings arising from the travel dispatch arrangements of journeys paid for by public authorities are estimated to total approximately 22 million euros.

Deploying ITS is also socio-economically profitable in all transport modes. The benefit-cost ratio for all measures in the Action Plan exceeds one and is above three for many of the measures when only direct impacts on traffic and transport and on the operations of the transport administration are included in the benefits. Many of the measures will also produce significant indirect benefits by, for example, creating new business opportunities or intensifying the operations of businesses using the services of the transport administrations. This may double or triple the benefit-cost ratios from the estimates based on direct impacts.



***Appendix 1: List of abbreviations***

***Appendix 2: Balanced Scorecards regarding ITS development and implementation by the transport administration***



## List of abbreviations

|                 |  |
|-----------------|--|
| <b>2,5G</b>     | The intermediate step between the second and third generation of mobile communications systems (GSM).  |
| <b>3G</b>       | A digital broadband mobile communications system that aims at creating global coverage. 3G covers the European and Japanese Universal Mobile Telecommunication System (UMTS) and the North American Standard CDMA2000. |
| <b>AIS</b>      | Automatic Ship Identification System. A system that positions and identifies vessels in maritime transport and transfers related information between the VTS centre and the vessels.                                   |
| <b>ATC</b>      | Automatic Train Control System. Provides signalling information for trains and prevents trains from driving against red lights or overspeeding.  |
| <b>ATLANTIC</b> | An aircraft parking guidance system.   |
| <b>ATM</b>      | Automated Traffic Measurement. ATM points provide cross-sectional data about traffic flow speed, density and volume.   |
| <b>AVACK</b>    | An airport passenger information system.   |
| <b>DAB</b>      | Digital Audio Broadcasting.  |
| <b>DSRC</b>     | Dedicated Short Range Communication. A radio link system at 5.8 GHz commonly used for applications including the transfer of data in road toll systems.  |
| <b>DVB</b>      | Digital Video Broadcasting.  |
| <b>ECDIS</b>    | Electronic Chart Display and Information System. A computer-based maritime navigation system.  |
| <b>ENC</b>      | Electronic Navigational Chart. The official digital chart data for ECDIS.  |
| <b>ETJ</b>      | Advance Notification System. Transmits information on changes impacting rail safety and on planned track work, including any changes in the signalling system.   |
| <b>EUROCAT</b>  | A trademark for an air traffic control system.   |
| <b>FIDS</b>     | Flight Information Display System. A system for providing passenger information at airports, on the Internet and teletext.   |
| <b>GSM-R</b>    | GSM-Rail. A digital GSM network for railways that uses media including group SMS messages and calls to notify of sudden incidents.   |
| <b>GOFREP</b>   | A mandatory ship reporting system covering the international waters in the Gulf of Finland.  |
| <b>HELCOM</b>   | The Helsinki Commission is the Baltic Marine Environment Commission.   |

|                 |  |
|-----------------|--|
| <b>HELMI a)</b> | The dynamic passenger information system used in rail traffic in the Helsinki control area.  |
| <b>HELMI b)</b> | Helsinki public transport signal priority and passenger information system.  |
| <b>HELKA</b>    | Remote control of rail traffic in the Helsinki control area.   |
| <b>IBNet</b>    | Icebreaking control that acts as a Decision Support System for the planning and monitoring of icebreaking and ensures the distribution of data entered into an icebreaker's database via a centre to other IBNet users (icebreakers, coordinating centres, VTS centres). IBNet also acts as a link in the coordination of the Finnish and Swedish icebreaker fleets. |
| <b>IBPlott</b>  | The graphical presentation tool of the IBNet system for displaying the winter traffic situation on top of ice charts or satellite images.  |
| <b>JuSe</b>     | The Finnish Rail Traffic Monitoring System.  |
| <b>KULTU</b>    | A rail transport monitoring system used by VR Cargo, the rail freight division of the Finnish Railways VR Ltd.   |
| <b>LiiTo</b>    | The Finnish Road Administration's operating model for distributing trafficability data. Information about road trafficability received from road users, the police or contract supervisors is transferred via Finnish Road Administration Traffic Management Centres to appropriate parties depending on the nature of the information.                              |
| <b>LK-tieto</b> | The user interface into the various databases for the operators of the Finnish Road Administration Traffic Management Centres.   |
| <b>TDC</b>      | Travel Dispatch Centre.  |
| <b>Navi</b>     | A programme for generating and updating data on sea routes, channel alignments, safety devices and depth soundings.  |
| <b>PAN</b>      | Personal Area Network. Utilises close-range data transfer methods (e.g. Bluetooth) in the user's immediate vicinity and enables the exchange of data between devices within a close range of the user.   |
| <b>PilotNet</b> | The Finnish system for pilot management and producing pilotage statistics and reports.   |
| <b>PortNet</b>  | A maritime information system covering key support functions, port functions, and functions and services related to vessel traffic control, monitoring and pilotage, with the most important being vessel schedule information. The system also provides information about the cargo onboard vessels, particularly hazardous substances.                             |
| <b>RDS-TMC</b>  | Radio Data System – Traffic Message Channel. A channel for broadcasting traffic and travel information on analogue FM transmissions using RDS. The messages coded for the channel are decoded by special TMC receivers and delivered either visually onscreen or as synthesised speech in the language enabled by the receiver.                                      |
| <b>TAIKA</b>    | Tampere Rail Traffic Remote Control Area.  |
| <b>UMTS</b>     | See 3G.  |
| <b>VTMIS</b>    | Vessel Traffic Management and Information System. A concept referring to several different vessel traffic systems (VTS, AIS, ...), not an actual system in itself.   |
| <b>VTS</b>      | Vessel Traffic Service. A vessel control and support system that also relays related information between the VTS centre and the vessels.   |
| <b>WLAN</b>     | Wireless Local Area Network.   |



## Balanced Scorecards regarding ITS development and implementation by the transport administrations

| CIVIL AVIATION ADMINISTRATION           |  |  |   |                    |
|---|--|--|---|--------------------|
| TARGET AREAS                            | CRITICAL SUCCESS FACTORS   | OBJECTIVES INTO 2007   | MEASURES INTO 2007  | COSTS 2004–2007 €m |
| Societal benefits and effectiveness     | <ul style="list-style-type: none"> <li>Measures set out in the Government Programme</li> <li>Efficiency of the transport system</li> <li>Safety of the transport system</li> <li>Environmental impacts of transport</li> <li>Competitiveness of businesses around Finland</li> <li>Competitiveness of air traffic</li> </ul>             | <ul style="list-style-type: none"> <li>Securing the operation of regional airports</li> <li>Eliminating accidents on scheduled flights</li> <li>Completing the reform of the air navigation service system</li> <li>Minimising delays caused by the airport operator</li> </ul>  | <ul style="list-style-type: none"> <li>Developing the forms of financing of regional airports</li> <li>Improving the reliability of national data communications</li> <li>Implementing the air navigation service development programme</li> <li>Developing the reliability of the baggage management system</li> </ul>   |                    |
| Consumer benefits                       | <ul style="list-style-type: none"> <li>Customer satisfaction</li> <li>Service coverage and quality</li> <li>Travel and transport costs and comfort</li> <li>Anticipation of mobility and transport and minimisation of adverse effects</li> <li>Electronic transactions</li> </ul>   | <ul style="list-style-type: none"> <li>Improving passenger information (scheduled flight airports, value-added services)</li> </ul>  | <ul style="list-style-type: none"> <li>Implementing the service database for dynamic timetable information and incorporating it into the public transport information portal</li> <li>Providing real-time route and timetable information for bus and train connections at airport</li> <li>Providing the route information system for Helsinki-Vantaa Airport</li> </ul> |                    |
| Stakeholders and network                | <ul style="list-style-type: none"> <li>EU and other international cooperation</li> <li>Cooperation between administrative sectors (the police, the Frontier Guard, Customs, regions, municipalities)</li> <li>Business activities in the sector (airlines and handling companies)</li> <li>Rules of play in the value network</li> </ul> | <ul style="list-style-type: none"> <li>Efficiently utilising membership in EUROCONTROL and other international organisations</li> <li>Networking efficiently with local actors related to tourism services</li> <li>Launching AirportNet in cargo traffic</li> <li>Defining the interfaces between the system of the CAA and the cooperation partners</li> </ul> | <ul style="list-style-type: none"> <li>Setting the responsibilities for and intensifying regional marketing</li> <li>Implementing AirportNet</li> <li>Defining and creating the interfaces necessary between the information systems</li> </ul>   |                    |
| Internal processes and operating models | <ul style="list-style-type: none"> <li>Resource management and processes</li> <li>Productisation</li> <li>Appropriate organisation</li> </ul>  | <ul style="list-style-type: none"> <li>Creating information systems that support the processes</li> <li>Updating process descriptions and specifications</li> <li>Implementing Customer Relationship Management</li> </ul>   | <ul style="list-style-type: none"> <li>Systematically describing, further specifying and maintaining the processes and information flows</li> <li>Specifying and implementing responsibilities for Customer Relationship Management</li> </ul>  |                    |
| Renewal, innovations and competence     | <ul style="list-style-type: none"> <li>R&amp;D activities and directing them</li> <li>Competence development</li> <li>Personnel satisfaction</li> </ul>  | <ul style="list-style-type: none"> <li>Utilising technological opportunities</li> <li>Maintaining sufficient competence</li> </ul>   | <ul style="list-style-type: none"> <li>Actively monitoring and utilising technological advancements</li> <li>Providing and facilitating continuous personnel training</li> <li>Developing management training</li> </ul>  |                    |
| Resources and finance                   | <ul style="list-style-type: none"> <li>Efficiency and cost awareness</li> <li>Financing</li> <li>Human and other resources</li> </ul>  | <ul style="list-style-type: none"> <li>Ensuring a sufficient number of technology experts in normal conditions and crisis situations</li> </ul>  | <ul style="list-style-type: none"> <li>Studying and utilising outsourcing opportunities</li> <li>Specifying and systematically recruiting key resources</li> </ul>  |                    |

FINNISH MARITIME ADMINISTRATION

| TARGET AREAS                        | CRITICAL SUCCEES FACTORS<br>(the most important ones)   | OBJECTIVES INTO 2007  | MEASURES   | COSTS<br>2004–2007 €m  |
|-------------------------------------|---|---|--|--|
| Societal benefits and effectiveness | <ul style="list-style-type: none"> <li>Measures set out in the Government Programme</li> <li>Efficiency of the transport system</li> <li>Traffic safety</li> <li>Environmental impacts of transport (incl. accidents)</li> <li>Competitiveness of businesses - maintaining the facilities for commercial shipping</li> <li>Interoperability of transport modes</li> </ul> | <ul style="list-style-type: none"> <li>Ensuring a level of sea route infrastructure and customer services provided by the FMA that creates good and equal conditions for businesses around Finland</li> <li>Increasing vessel traffic safety and environmental protection, with monitoring covering users of shipping lanes</li> <li>Improving the hydrographic survey data for the main fairways and maritime routes, with full coverage of ENC data</li> <li>Ensuring that the annual number of accidents does not exceed the target set</li> <li>Carrying out the measures set in the HELCOM convention to minimise the environmental impacts of vessel traffic on the Baltic</li> <li>Carrying out the measures set out in the cooperation agreement between Russia, Estonia and Finland to reduce the risk of vessel accidents in the Gulf of Finland</li> </ul> | <ul style="list-style-type: none"> <li>Implementing the FMA Navi strategy and hadrography development programmes</li> <li>Providing the customer services under FMA responsibility cost-effectively so that the service level requirements set are met at minimum costs</li> <li>Bringing all commercial shipping lanes within the scope of the active VTS (approx. 5,000nm)</li> <li>Commitment to real-time use of PortNet</li> <li>Expanding the VTS to the open sea areas of the Gulf of Finland</li> <li>Performing the hydrographic surveys on the HELCOM routes</li> <li>Implementing the AIS network of HELCOM</li> <li>Implementing the agreement between Russia, Estonia and Finland</li> </ul>  | <ul style="list-style-type: none"> <li>See below</li> <li>7.54</li> <li>0.01</li> <li>1.0</li> <li>0.03</li> </ul> |
| Consumer benefits                   | <ul style="list-style-type: none"> <li>Customer satisfaction</li> <li>Knowledge of customer needs</li> <li>Service coverage and quality</li> <li>Travel and transport costs and efficiency</li> <li>Electronic transactions</li> </ul>  | <ul style="list-style-type: none"> <li>Keeping pilotage waiting times below 2 hrs, average icebreaking assistance waiting time under 4 hrs and ensuring that 90-95% of all traffic runs without periods of waiting</li> <li>Improving cooperation between authorities in incident management</li> <li>Ensuring that services meet customer expectations (PortNet, paper-free ports)</li> <li>Electronic transactions on the one-stop-shop principle (PortNet)</li> <li>Interoperability between transport and traffic information system</li> <li>Maintaining the radio navigation system at the level required by the IMO</li> </ul>   | <ul style="list-style-type: none"> <li>Providing basic services (waterway maintenance and development, pilotage, icebreaking, hydrographic surveys, hydrography, monitoring maritime safety); specifying the services and service levels; ensuring service production</li> <li>Developing and using the centralised maritime transport information system and other management of maritime transport information (PortNet, PilotNet, VTS, VTMS, the reporting system for water depth and local weather)</li> <li>Maintaining depth sounding and safety device data regarding the national sea route network (VATU, VARE, SYRE etc.)</li> <li>Ensuring the icebreaking service level (IBNet &amp; IBPlott)</li> <li>Vessel positioning and identification (DGPS, AIS)</li> <li>Real-time traffic and schedule information</li> <li>Increasing the coverage of ECDIS services</li> <li>Ensuring the availability of ENC data required by ECDIS services</li> </ul> | <ul style="list-style-type: none"> <li>0.7</li> <li>2.5</li> <li>0.3</li> <li>4.75</li> <li>0.1</li> </ul>         |

|   |   |  |   |  |
|---|---|--|---|--|
| Stakeholders and network                | <ul style="list-style-type: none"> <li>• EU and other international cooperation</li> <li>• Cooperation between EU traffic and transport information system</li> <li>• Cooperation between the administrative sectors</li> <li>• Cooperation between ports</li> <li>• Business activities in the sector</li> <li>• Rules of play in the ITS value chain and network</li> </ul> | <ul style="list-style-type: none"> <li>• Supporting service provision in the sector, creating a market</li> <li>• Deepening cooperation to reach the level required by new services</li> <li>• Creating interoperability between the EU traffic and transport information system</li> <li>• Intensifying cooperation within and between the administrative sectors</li> </ul>  | <ul style="list-style-type: none"> <li>• Specifying the role of the FMA in the network of service provision -&gt; acting as the provider of the service specified and acting accordingly</li> <li>• Participating actively in the EU and other international forums (ITU, IHO, IMO, IALA)</li> <li>• Creating interoperability of technical solutions in the context of interoperability between traffic and transport information systems</li> </ul>   | <ul style="list-style-type: none"> <li>• 0.2</li> <li>• 0.1</li> </ul>                   |
| Internal processes and operating models | <ul style="list-style-type: none"> <li>• Resource management</li> <li>• Appropriate organisation</li> </ul>   | <ul style="list-style-type: none"> <li>• Productising traffic management services</li> <li>• Adopting the client-supplier model at FMA from the beginning of 2004</li> <li>• Developing the procurement order procedures</li> <li>• Intensifying ITS development activities</li> <li>• Completing the digital ENC charts on all areas required by vessel traffic</li> <li>• Basing all information services on up-to-date digital information registers</li> </ul> | <ul style="list-style-type: none"> <li>• Productising vessel traffic management and acting as an active service producer</li> <li>• Organising the ITS function</li> <li>• Marketing the services</li> <li>• Ensuring the implementation of the Navi strategy</li> <li>• Developing hydrographic surveys to meet the changing technological and user requirements</li> </ul>  | <ul style="list-style-type: none"> <li>• 0.6</li> <li>• 0.01</li> <li>• 1.5</li> </ul>   |
| Renewal, innovations and competence     | <ul style="list-style-type: none"> <li>• R&amp;D activities and directing them</li> <li>• Competent personnel</li> <li>• Personnel availability and satisfaction</li> </ul>   | <ul style="list-style-type: none"> <li>• Implementing a multiannual FMA level R&amp;D programme</li> <li>• Maintaining the personnel's capacity for and wellbeing at work, improving job satisfaction</li> <li>• Training the personnel in the management and application of information</li> </ul>  | <ul style="list-style-type: none"> <li>• Commitment at FMA level to a multiannual R&amp;D programme / financing</li> <li>• Investing in recruiting new personnel</li> <li>• Training and motivating</li> </ul>  | <ul style="list-style-type: none"> <li>• 2.0</li> </ul>                                  |
| Resources and finance                   | <ul style="list-style-type: none"> <li>• Efficiency and cost awareness</li> <li>• Ensuring sufficient financing</li> <li>• Human and other resources</li> </ul>   | <ul style="list-style-type: none"> <li>• Ensuring that the traffic management methods used are cost-effective</li> <li>• Bringing financing up to the target level</li> <li>• Prioritising financing</li> <li>• Ensuring a sufficient number of competent personnel</li> </ul>   | <ul style="list-style-type: none"> <li>• Defining the operating processes (equipment, personnel, network, stakeholder groups)</li> <li>• Exploring cost-effective methods</li> <li>• Further studying the impacts of traffic management</li> <li>• Ensuring the personnel's competence level, motivation and commitment to the high-quality and efficient attendance to their duties through actively looking after the personnel and their working conditions</li> <li>• Ensuring sufficient financing and aiming at maximum cost-effectiveness in all activities</li> </ul> | <ul style="list-style-type: none"> <li>• 0.01</li> <li>• 0.01</li> <li>• 0.01</li> </ul> |

| FINNISH RAIL ADMINISTRATION         |  |  |  |   |
|-------------------------------------|--|--|--|---|
| TARGET AREAS                        | CRITICAL SUCCESS FACTORS<br>(the most important ones)  | OBJECTIVES INTO 2007   | MEASURES   | COSTS<br>2004–2007 €m   |
| Societal benefits and effectiveness | <ul style="list-style-type: none"> <li>Facilitating the efficiency of the transport system</li> <li>Safety of the transport system</li> <li>Reducing the environmental impact of traffic (noise, vibration)</li> <li>Promoting the competitiveness of businesses</li> </ul>                | <ul style="list-style-type: none"> <li>Improving the smoothness of travel chains through real-time information and control</li> <li>Automating and introducing train control to all passenger lines and the main freight lines</li> <li>Developing the equipment control system</li> </ul>   | <ul style="list-style-type: none"> <li>Improving preparedness to produce real-time information, particularly on the busiest passenger lines</li> <li>Reforming information background systems and databases to meet the challenges posed by rail transport competition</li> <li>Mapping the need for targeted investments required by traffic control</li> <li>Implementing the ATC system as planned (Phase III by the end of 2005)</li> <li>Renewing the radio system for rail traffic control (GSM-R)</li> <li>Installing hot box and wheelflat detectors</li> <li>Installing leak detectors on routes used for hazardous substances</li> </ul> | <ul style="list-style-type: none"> <li>50.0 + 50.0 (ATC + automation)</li> <li>GSM-R 50.0</li> <li>Hot box 10.0 + Wheelflat 2.0</li> <li>Leak 2.0</li> </ul>  |
| Consumer benefits                   | <ul style="list-style-type: none"> <li>Customer satisfaction (transport operators and their customers)</li> <li>Service coverage and quality</li> <li>Smoothness of travel and transport</li> </ul>  | <ul style="list-style-type: none"> <li>Achieving 95% reliability of timetables at end stations</li> <li>Making up-to-date travel time forecasts available for the busiest connections</li> <li>Facilitating the creation of commercial information services</li> <li>Incident management / cooperation between authorities</li> <li>Meeting customer's service expectations</li> </ul>   | <ul style="list-style-type: none"> <li>Automating traffic control (block signal and remote control)</li> <li>Implementing trail monitoring (JuSe) on passenger lines and busy freight lines (based on control and GSM-R)</li> <li>Managing and distributing real-time rail traffic information</li> <li>Warning about passing high-speed trains using dynamic message signs</li> <li>Extending the centralised traveller information systems to the travel interchanges</li> <li>Improving and automating the station announcement system</li> </ul>   | <ul style="list-style-type: none"> <li>JuSe 1.0</li> <li>Information system 2.0</li> <li>Dynamic message signs 3.0</li> <li>Extension of information system 5.0</li> <li>Announcements 1.0</li> </ul> |
| Stakeholders and networks           | <ul style="list-style-type: none"> <li>EU cooperation</li> <li>Other international cooperation (Russia, Nordic countries)</li> <li>Cooperation between transport modes and authorities</li> <li>Cooperation with transport operators</li> <li>Business activities in the sector</li> </ul> | <ul style="list-style-type: none"> <li>Influencing EU policies</li> <li>Defining the interfaces between the systems of the Finnish Rail Administration, the transport operators and other cooperation partners</li> <li>Reaching a common view with the transport operators on the development directions</li> <li>Specified cooperation between authorities regarding incident management</li> <li>Innovative ITS services</li> </ul> | <ul style="list-style-type: none"> <li>Participating actively in EU forums</li> <li>Defining and implementing the necessary interfaces</li> <li>Organising public transport incident management for the capital region</li> <li>Specifying and implementing general telematics strategies</li> <li>Pursuing an open communications policy</li> </ul>   | <ul style="list-style-type: none"> <li>2.0</li> </ul>   |

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|---|--|--|--|--|
| Internal processes and operating models | <ul style="list-style-type: none"> <li>• Resource management</li> <li>• Productisation</li> <li>• <a href="#">Appropriate organisation</a></li> </ul>  | <ul style="list-style-type: none"> <li>• Organising traffic control as required by the rail transport competition situation</li> <li>• Organising traveller information services as required by the competition situation</li> <li>• Organising traffic and transport planning as required by the competition situation</li> </ul> | <ul style="list-style-type: none"> <li>• Reaching a consensus about the manner of organising traffic control and traveller information services</li> <li>• Organising the traffic and transport planning system appropriately</li> <li>• Implementing the traffic and transport planning and capacity distribution system</li> <li>• Organising the maintenance and servicing of ITS systems appropriately</li> <li>• Planning second-generation automation</li> </ul> | <ul style="list-style-type: none"> <li>• 30.0</li> </ul> |
| Renewal, innovations and competence     | <ul style="list-style-type: none"> <li>• R&amp;D activities and directing them</li> <li>• <a href="#">Retaining existing competence in the organisation and developing it</a></li> <li>• Personnel satisfaction</li> </ul> | <ul style="list-style-type: none"> <li>• Ensuring wide-based and up-to-date basic competence</li> <li>• Reaching our own view on the lines of telematics development in rail traffic</li> <li>• Ensuring sufficient competence in the consultant sector</li> </ul>   | <ul style="list-style-type: none"> <li>• Implementing the continuous R&amp;D programme</li> <li>• Developing the pay system</li> <li>• Entering into framework agreements with a few consultants</li> <li>• Actively cooperating with the education system</li> <li>• Fixed-form in-house training programme (new employees, continuous training)</li> </ul>   |  |
| Resources and finance                   | <ul style="list-style-type: none"> <li>• Efficiency and cost awareness</li> <li>• Financing</li> <li>• <a href="#">Human and other resources</a></li> </ul>  | <ul style="list-style-type: none"> <li>• Using cost-effective traffic management methods</li> <li>• Ensuring a sufficient number of competent personnel</li> <li>• Securing a sufficient level of financing to be able to implement the automation traffic control as planned</li> </ul>   | <ul style="list-style-type: none"> <li>• Specifying and systematically recruiting key resources</li> <li>• Exploring cost-effective methods</li> </ul>   |  |
|   |  |  |  |  |

| FINNISH ROAD ADMINISTRATION         |   |   |   |   |
|-------------------------------------|---|---|---|---|
| TARGET AREAS                        | CRITICAL SUCCESS FACTORS<br>(the most important ones)   | OBJECTIVES INTO 2007  | MEASURES  | COSTS<br>2004–2007 €m   |
| Societal benefits and effectiveness | <ul style="list-style-type: none"> <li>Measures set out in the Government Programme</li> <li>Efficiency of the transport system</li> <li>Safety of the transport system</li> <li>Environmental impacts of transport</li> <li>Competitiveness of businesses</li> </ul>   | <ul style="list-style-type: none"> <li>Improving the predictability of travel times, particularly on main trunk roads</li> <li>Improving traffic safety by 40 cases of bodily injury by the year 2007</li> </ul>  | <ul style="list-style-type: none"> <li>Deploying the real-time traffic status monitoring system on the most significant interurban connections and major urban areas (Helsinki, Turku, Tampere and Oulu) in accordance with the general plan; this will improve the quality of the current services</li> <li>Enhancing road surface condition monitoring and improving the quality of information on road surface condition</li> <li>Developing the dissemination of real-time information through mass media (incl. the Internet)</li> <li>Deploying dynamic real-time traffic control at local problem sites, when improving road quality or in connection with new road investments where necessary</li> <li>Extending the use of dynamic speed limits</li> <li>Increasing automated enforcement in cooperation with the police on the most accident-prone roads to cover another 200km</li> <li>Increasing park and ride facilities and public transport information systems at public transport stops on public roads</li> </ul> | <ul style="list-style-type: none"> <li>15.0</li> <li>1.0</li> <li>20.0</li> <li>1.0</li> <li>1.0</li> </ul> |
| Consumer benefits                   | <ul style="list-style-type: none"> <li>Understanding user needs and customer satisfaction</li> <li>Service availability and quality</li> <li>Costs and comfort of travel and transport throughout the travel and transport chain</li> <li>Anticipation of mobility and transport and minimisation of adverse effects</li> </ul> | <ul style="list-style-type: none"> <li>Facilitating the creation of commercial information services</li> <li>Ensuring that basic services (information through mass media, incident management, traffic control) meet users' pre-trip and en-route needs</li> </ul> | <ul style="list-style-type: none"> <li>Providing reliable source information for the needs of commercial information services</li> <li>Providing basic traffic management services (Traffic Management Centres), ensuring the use and maintenance of the system</li> <li>Managing and distributing information in compliance with mutually agreed interfaces</li> <li>Creating a traffic smoothness database providing real-time traffic situation data by road section</li> <li>Maintaining the National Road and Street Database (Digiroad)</li> <li>Continuously studying customer needs and satisfaction</li> </ul>   | <ul style="list-style-type: none"> <li>35.0</li> <li>0.5</li> <li>0.5</li> <li>4.8</li> </ul>               |
|                                     |   |   |   |   |

|   |  |  |  |   |
|---|--|--|--|---|
| Stakeholders and networks               | <ul style="list-style-type: none"> <li>• Cooperation within the administrative sector and between the different administrative sectors</li> <li>• Team play in the value network</li> <li>• Business activities in the sector</li> <li>• Cooperation in urban areas</li> <li>• EU and other international cooperation</li> </ul> | <ul style="list-style-type: none"> <li>• Regional cooperation between authorities</li> <li>• More efficient incident management</li> <li>• Supporting service provision in the sector, creating a market</li> <li>• Influencing EU policies in cooperation with the administrative sector</li> </ul>   | <ul style="list-style-type: none"> <li>• Creating the regional Traffic Management Centres (Helsinki Metropolitan Area, Turku, Tampere, Oulu) on the basis of regional needs</li> <li>• Creating joint operating models and interoperable information systems for the different authorities (municipalities, the police, emergency response centres, the Frontier Guard, Customs)</li> <li>• Planning alternative routes and completing the related signposting for the busiest main roads</li> <li>• Specifying the role of the Road Administration (Finnra) in the value network of service production and accordingly</li> <li>• Participating actively in the EU forums, supporting the Ministry of Transport and Communications</li> </ul> | <ul style="list-style-type: none"> <li>• 3.0</li> <li>• 1.0</li> <li>• 3.0</li> </ul> |
| Internal processes and operating models | <ul style="list-style-type: none"> <li>• Resource management</li> <li>• Productisation</li> <li>• Appropriate organisation</li> </ul>  | <ul style="list-style-type: none"> <li>• Making traffic management a genuine part of the selection of road maintenance and development tools</li> <li>• Clarifying the functions through measures incl. specifying the service contents and identifying the customers and creating task descriptions for those involved</li> </ul>   | <ul style="list-style-type: none"> <li>• Integrating traffic management into the transport system planning process, studying effectiveness in the various stages of the process</li> <li>• Researching the effectiveness of traffic management</li> <li>• Developing guidelines and quality requirements in cooperation with procurement</li> <li>• Specifying the traffic and transport services and products, including service levels and processes</li> </ul>  | <ul style="list-style-type: none"> <li>• 0.09</li> </ul>                              |
| Renewal, innovations and competence     | <ul style="list-style-type: none"> <li>• R&amp;D activities and directing them</li> <li>• Sufficient competence</li> <li>• Personnel satisfaction</li> </ul>   | <ul style="list-style-type: none"> <li>• Implementing a multiannual Finnra-level R&amp;D programme in accordance with mutual policies of the administrative sector and the needs of the customers</li> <li>• Developing the utilisation of results</li> <li>• Developing the competence of the producers of telematics, consulting and R&amp;D services</li> <li>• Ensuring a sufficient number of competent Finnra personnel</li> </ul> | <ul style="list-style-type: none"> <li>• Commitment at Finnra level to a multiannual R&amp;D programme / securing financing</li> <li>• Systematising the utilisation and ensuring the deployment of the results</li> <li>• Systematising the assessment of demand for R&amp;D and acting accordingly</li> <li>• Creating and implementing a plan for competence development</li> </ul>   |   |
| Resources and finance                   | <ul style="list-style-type: none"> <li>• Efficient use of resources and cost awareness</li> <li>• Financing</li> <li>• Human and other resources</li> <li>• Information infrastructure</li> </ul>  | <ul style="list-style-type: none"> <li>• Using cost-effective traffic management methods</li> <li>• Keeping financing at the target level</li> <li>• Decreasing road maintenance and development costs and increasing economy</li> </ul>   | <ul style="list-style-type: none"> <li>• Exploring cost-effective traffic management methods</li> <li>• Improving and harmonising cost monitoring</li> <li>• Identifying the resources and policies for traffic management centres and other traffic management measures (personnel, financing) in 2003 and in the target state in 2007 as well as planning the steps towards the target state</li> <li>• Acting on the basis of the above specifications</li> <li>• Developing and maintaining information infrastructure equipment and systems</li> </ul>  |   |





**Ministry of Transport and Communications**

PO Box 31

FI-00023 Government

Finland

Tel. +358 9 160 02

**[www.mintc.fi](http://www.mintc.fi)**