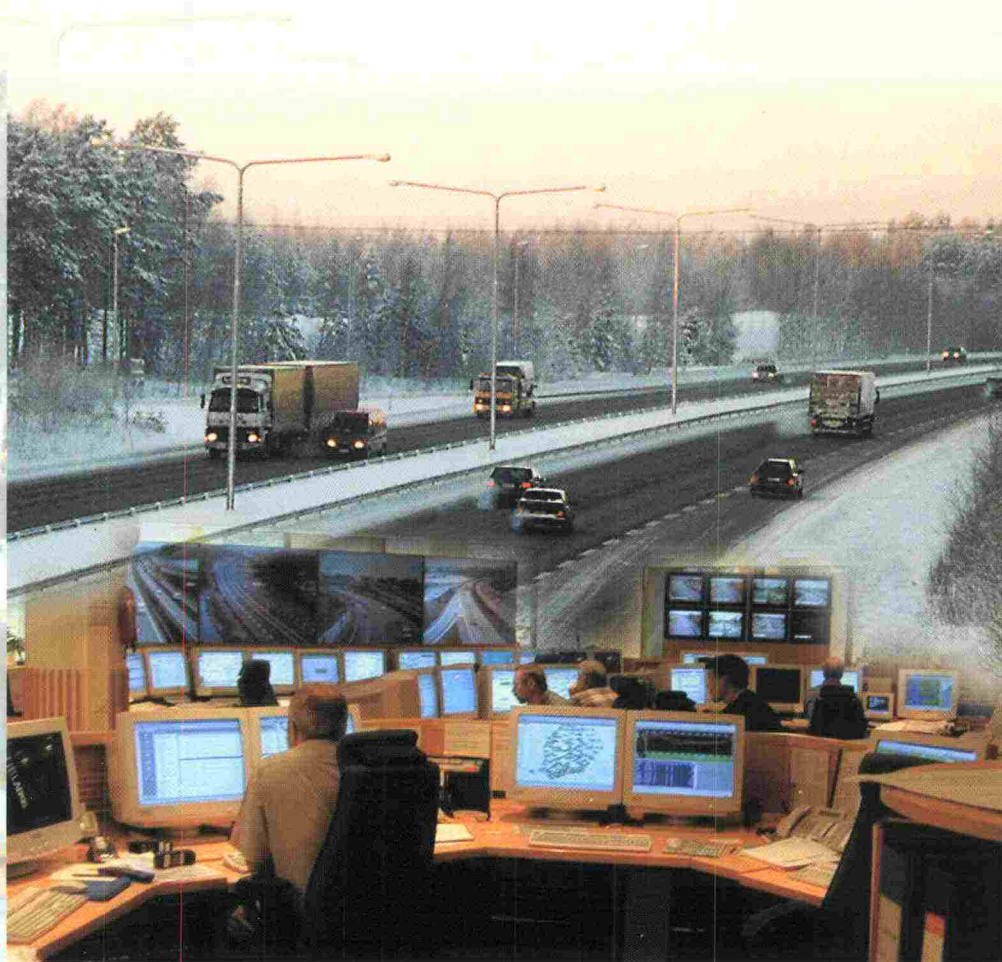


# TRAFFIC MANAGEMENT POLICY OF THE FINNISH ROAD ADMINISTRATION FOR 2001 - 2015



Helsinki 2000

Finnish Road Administration  
Traffic Services



# TRAFFIC MANAGEMENT

## – A means of road management

- Road surface condition
- Traffic conditions
- Roadworks
- Events
- Incidents

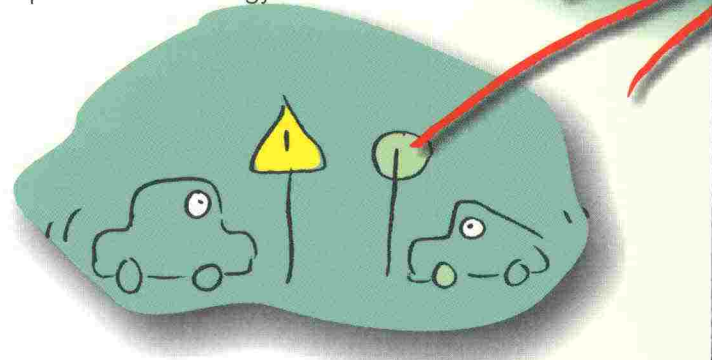
Road user

The Finnish Road Administration (Finnra) reviewed its traffic management policy during the year 2000. New trends in traffic politics, the rapid development of information technology and telematics, low funding and the established status of traffic management in overall road management made such an update necessary.

Finnra's reviewed traffic management policy is presented here and in the detailed background report (available only in Finnish). The purpose of the reports is to assist Finnra in its own decision-making as well as that of its co-operation partners in the area of traffic management. Fixed road traffic signs and road markings are not included in the policy and separate guidelines will be prepared for these. The focus of traffic management has shifted towards providing collective information on traffic conditions, incidents, roadworks, weather, road surface conditions and incident management. Such services require effective development of monitoring and data handling systems. The reviewed guidelines include funding allocation for different traffic management functions and will be revised every 3 to 4 years.

Challenges for traffic management

- Road users' expectations
- Development of information society
- Funding of road management
- Development of technology



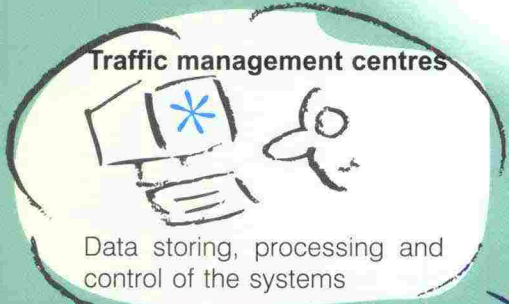
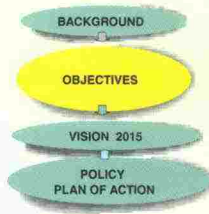
### BACKGROUND

**Finnra is responsible for** ensuring the efficiency and safety of the road transport system while minimising environmental impacts on public roads. Traffic management is a means of road management and forms an integral part of achieving common road management goals.

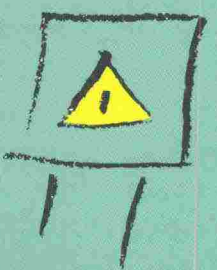
Finnra's most important traffic management functions are **traffic information, traffic control and incident management**. These functions are

operated by traffic management centres which monitor traffic and road weather conditions, mainly with the help of real-time monitoring systems but also from reports provided by other actors. Monitoring systems provide information about road surface conditions, weather, traffic conditions, roadworks, road maintenance measures and incidents. Telematics, i.e. data processing and tele-communications technologies, are extensively utilised in traffic management.





**REAL-TIME MONITORING SYSTEMS**



- Traffic information
- Traffic control
- Incident management
- Demand management
- Driver assistance and enforcement systems

**TRAFFIC MANAGEMENT FUNCTIONS IN A NUTSHELL**

**Traffic information**

Traffic information is used to provide road users with both pre-trip and on-trip real-time information about road surface conditions and weather, traffic conditions, roadworks, road maintenance measures and traffic incidents.

**Traffic control**

Traffic may be controlled at the level of intersections, road links or the road network, using fixed or variable signs. Traffic control with fixed signs includes normal traffic signs and road markings. Traffic control with variable signs implements traffic- and weather-controlled variable speed limits, warning systems and traffic signals.

**Incident management**

Incident management covers the detection, handling and removal of traffic incidents (such as accidents) in co-operation with other authorities.

**Demand management**

Demand management aims to guide the decisions taken by road users regarding trip destination, time, mode of travel, or route. Demand management measures comprise e.g. access or parking control, park & ride, promotion of car pooling, support of public transport, cycling and walking, and congestion or cordon pricing.

**Other functions**

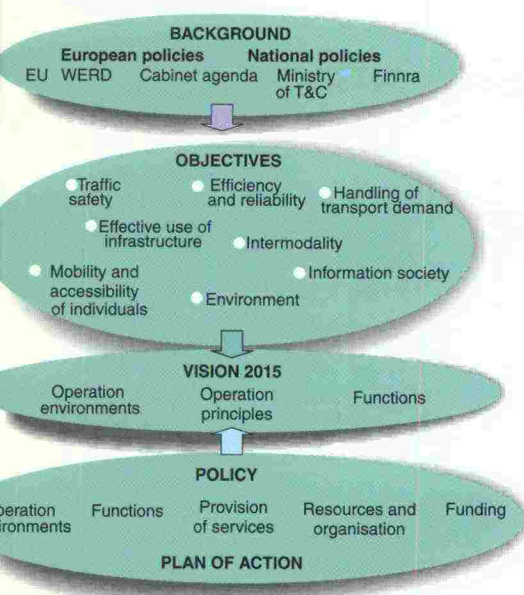
Enforcement systems include automatic speed and intersection enforcement, monitoring of hazardous goods transport, and automatic lane enforcement. Driver assistance systems are telematics systems which support the driver in avoiding collisions, lane keeping, navigating, etc. Fleet management covers planning, monitoring and control of goods transport vehicles. Freight management comprises handling of goods transport chain functions and information flows.

**OBJECTIVES**

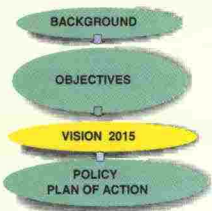
**The objectives of traffic management**

are based on the policies of the European Union, National Government and the Ministry of Transport and Communications. The main objectives are:

- Traffic safety
- Efficiency and reliability of transport
- Effective handling of transport demand
- Effective use of infrastructure
- Intermodality
- Mobility and accessibility of individuals
- Reduction of environmental impacts of traffic
- Promotion of information society

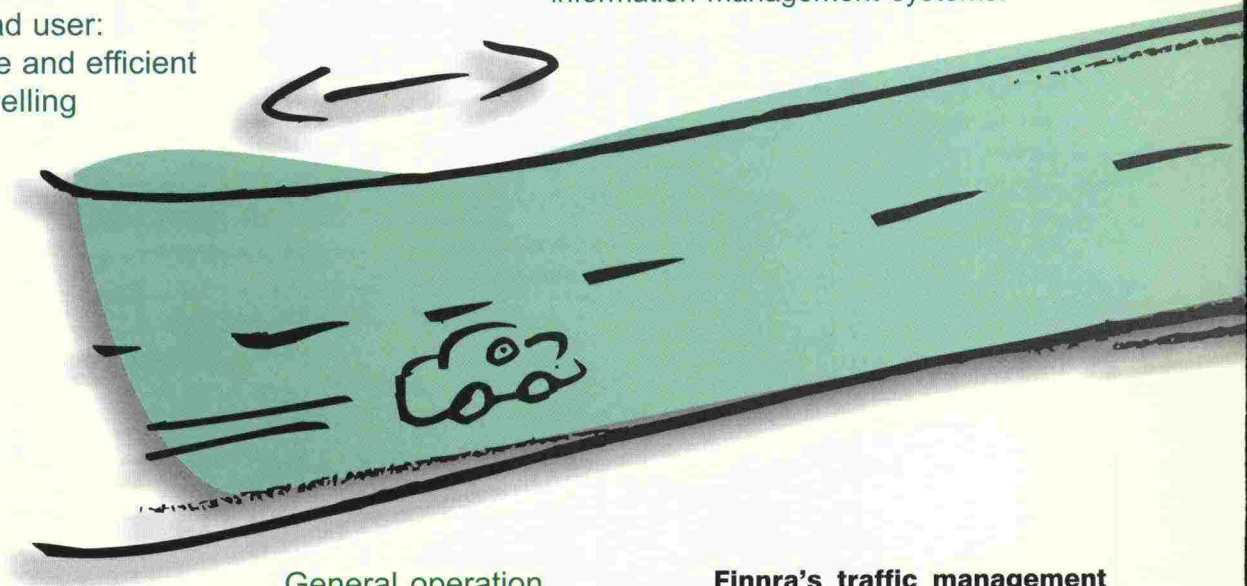






# VISION OF TRAFFIC MANAGEMENT FOR 2015

Road user:  
Safe and efficient  
travelling



Finnish Road Administration (Finnra):  
High quality main traffic management  
services require funding to be channeled  
towards real-time data collection and  
information management systems.

## General operation principles

### The Finnish Road Administration (Finnra) is responsible for:

- using traffic management functions to ensure safe, efficient and environmentally friendly traffic in all traffic, weather and road surface conditions.
- traffic management centres that operate the traffic management systems and information exchange with domestic and foreign co-operation partners.
- the monitoring systems required for data collection and the management of data for public roads in co-operation with other actors.

## Finnra's traffic management systems:

- are interoperable with those of other actors responsible for road traffic, and with the telematic systems of operators of different transport modes, thus promoting the intermodality of different modes of transport.
- are based on an open system architecture, enabling the interoperability of systems.

## Traffic management services

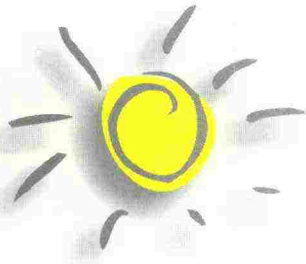
fall into four categories:

- Services provided by the authorities
- Public services
- Value-added public-private partnership services
- Commercial services.

The vision of traffic management for the year 2015 has been defined with respect to general operation principles, operating environments and traffic management functions. The vision describes the circumstances expected to prevail in 2015 if the envisioned actions are taken. The vision for the general operation principles and operating environments is outlined in this report. That for management functions is described in greater detail in the background report (available only in Finnish).

Main traffic management services are:

- Traffic information collectively
  - Traffic conditions
  - Incidents
  - Road works
  - Weather
  - Road surface conditions
- Incident management



Finnra is responsible for the services provided by the authorities and for public services.

**Authority services** are often statutory functions aimed at ensuring the safety and accessibility of the road transport network.

**Public services** are socio-economically beneficial services that promote traffic safety and efficiency and reduce the environmental impacts of traffic.

**Value-added public-private partnership services** include e.g. traffic information provided for the user in individualised or customised form or delivered through the media of the customer's choice. These services generally increase the comfort of driving or travelling and can also indirectly have a positive effect on traffic safety and efficiency. Finnra does not provide these

individualised services but may help to generate them.

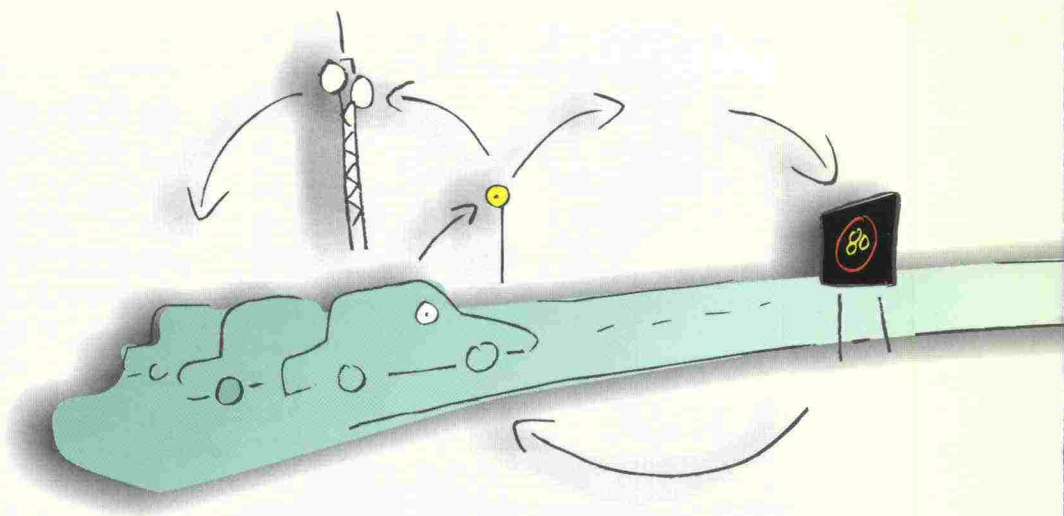
**Commercial services** are based on the end-user's willingness to pay for individualised services produced by commercial actors. Finnra provides information on the road transport system to commercial actors to help further the development of these markets.

**The services provided by Finnra are reliable and of high quality.** The selection of available services varies with the amount of traffic and road users' needs.

**Finnra distributes its traffic information collectively.** This is usually broadcast to the road users' in-vehicle device, such as radio receiver etc. Variable message signs are used in special locations.

Real-time traffic control systems and demand management systems are used at socio-economically beneficial locations as an alternative or complementary function to other road management measures. They are not used if they reduce traffic safety or increase negative environmental impacts. From the user's point of view the systems operate throughout the road transport system in a consistent and understandable way.





## OPERATING ENVIRONMENTS

**On motorways, on the trunk road network, in the Helsinki metropolitan area and in large urban areas**, road users are provided with real-time pre-trip and on-trip information about traffic flows, incidents, roadworks, road surface conditions and weather. Traffic incidents are detected and handled efficiently. An existing plan for alternative routing in case of incidents is readily applicable together with signposting using fixed and extra signs.

Problems related to traffic flow occur mostly on **motorways** in seasonal traffic. In high traffic volumes of this type, accidents may cause significant disturbances to traffic. Furthermore, road users' expectations relating to safety and efficiency on motorways are higher than on other roads. Motorway intersections are numbered for purposes of traffic information and indicated in this way on both maps and road traffic signs. Variable speed limits, lane control systems and route guidance systems are used at specific locations. Lane-keeping

systems may be tested by year 2015. An extensive real-time traffic monitoring system, together with relevant information systems, exists on motorways.

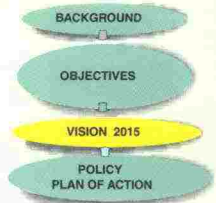
**Main roads have many sections with safety- and flow-related problems** such as bridges, tunnels and road sections with poor geometry. Variable speed limits, local warnings of slipperiness or large animals, lane control with relevant enforcement systems, route guidance and traffic signals may be used along these sections. Important tunnels and bridges are equipped with traffic control systems to ensure traffic efficiency and safety in all circumstances. Lane-keeping systems may be tested in order to reduce head-on collisions and avoid driving-off-the-road accidents.

Flow-related problems on **the trunk road network** occur mostly on summer weekends, during seasonal holidays, and due to unexpected traffic incidents. On the trunk road network, traffic management occurs in real-time and requires real-time monitoring

of traffic and road weather conditions.

Arterial and ring roads around the **Helsinki metropolitan area** are Finland's most heavily operated roads, where daily incidents, traffic-flow and noise related problems occur. Traffic emissions also occasionally cause air quality problems. Network based traffic signal control systems are used in co-operation with the municipalities. Variable speed limits, lane control systems and route guidance may be used on arterial and ring roads. Traffic signals will no longer be used on arterial and ring roads in the Helsinki metropolitan area by 2015. Traffic management functions on these arterial and ring roads require real-time monitoring, and noise and air quality monitoring may also be required.

Daily incidents and problems related to traffic flow and noise occur on arterial and ring roads around **large urban areas**. In addition, traffic emissions occasionally cause poor air quality. Traffic signal control and

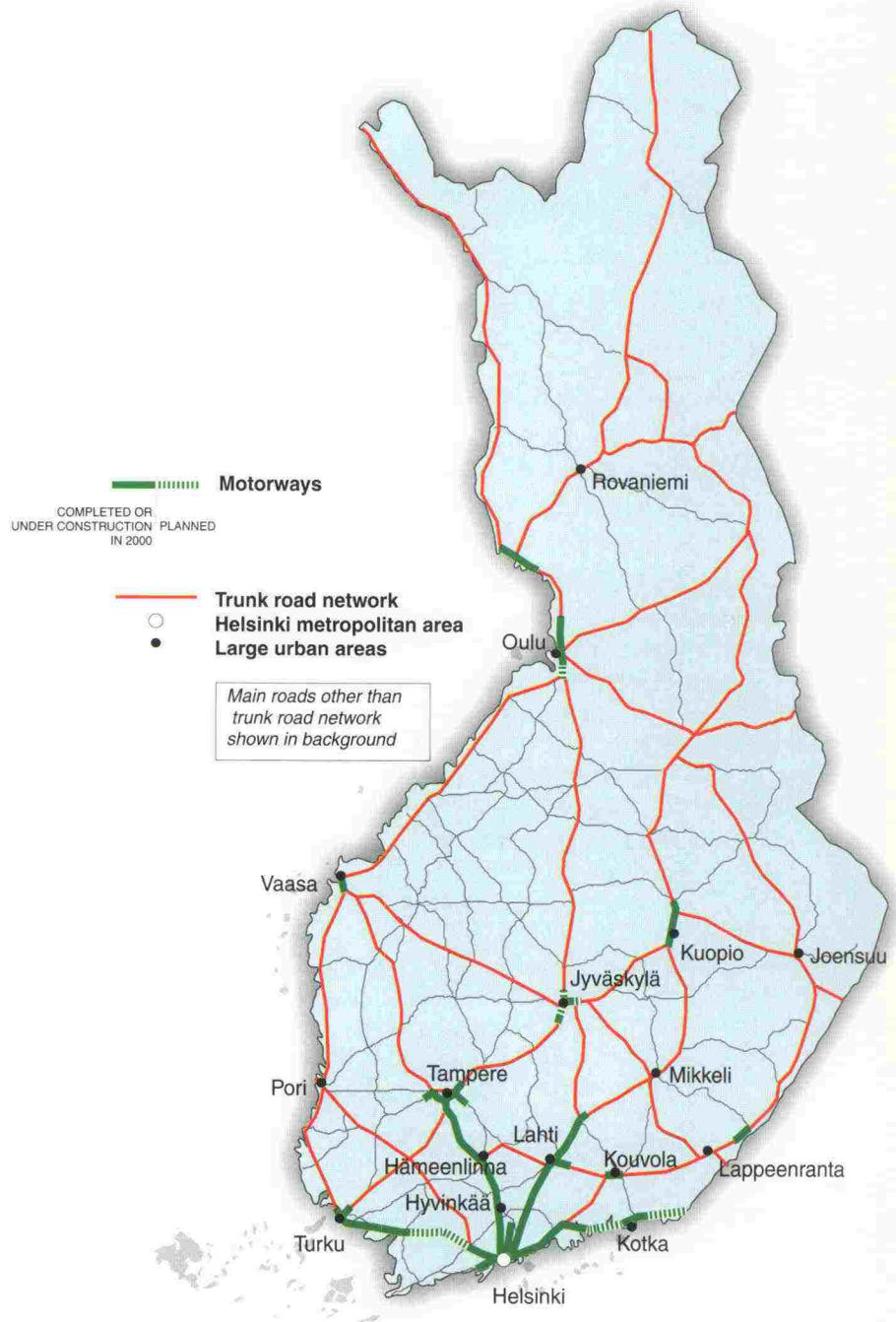


Operating environment of traffic management:

- Motorways
- Specific problem sections on main roads
- Trunk road network
- Helsinki metropolitan area
- Large urban areas
- Other roads

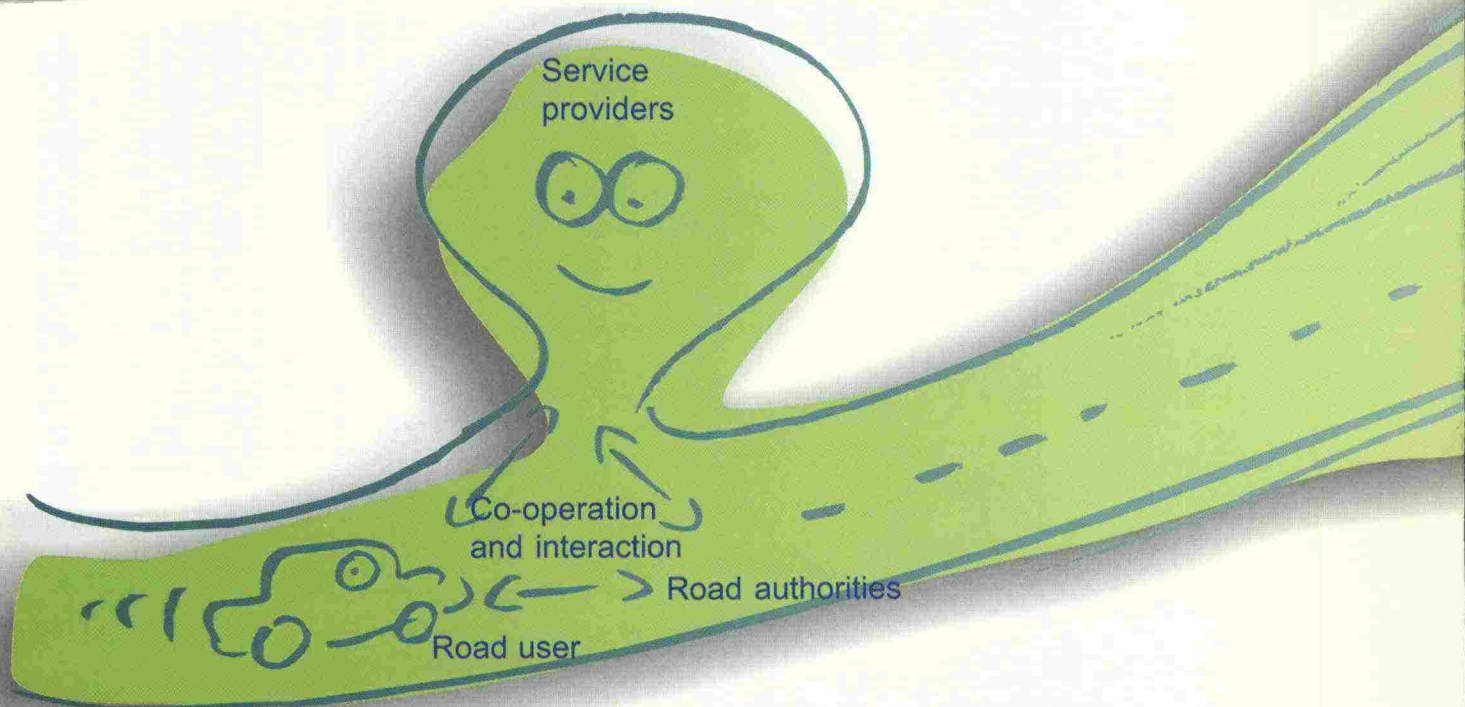
route guidance are used in co-operation with other actors responsible for traffic control on municipal streets. Variable speed limits, lane control systems and route guidance may be used on arterial and ring roads. Traffic management functions on most important arterial and ring roads require real-time monitoring of traffic and road weather conditions. Air quality monitoring by the municipalities may also be needed. On other roads traffic management focuses on co-operation with other actors, mostly municipal authorities, and the main objective is to promote intermodality and effective handling of transport demand.

**On other roads** in rural areas traffic problems may be significant for a single road user, but not for the transport system as a whole. Traffic information includes local information on weather and weather forecasts, road and traffic conditions. Real-time monitoring systems will not be implemented in this operating environment. Real-time road weather monitoring may, however, be used at specific locations. Commercial transport operators are informed about frost damage, roadworks and incidents. Signal control is used at intersections when required.





# TRAFFIC MANAGEMENT POLICIES



## FOCUS ON PROBLEM SECTIONS ON THE TRUNK ROAD NETWORK AND IN URBAN AREAS

The focus of traffic management functions is on operating environments where traffic management functions are most effective. These are the main road sections with specific traffic safety and/or capacity problems and arterials and ring roads of cities and motorways. The trunk road network is equipped with main traffic management services. These services and their operations are set up directly in relation to the required quality of service.

**On problematic road sections,** traffic management functions focus on the specific problems of these sections. On the **arterials and ring roads of cities,** for instance, the emphasis is on demand management of peak hour traffic and on incident management in co-operation with

other actors. In the case of **motorways** the emphasis shifts to traffic safety, efficiency and incident management. **The trunk road network** will be equipped with main traffic management services. On other roads the efficiency of commercial transport will be promoted.

**The quality of traffic management services** will be kept high and the coverage of services integrated and consistent.

## CONCENTRATING ON ESSENTIAL FUNCTIONS, PROVIDING GOOD QUALITY

The emphasis of Finnra's traffic management is on core functions that are most effective for ensuring traffic safety, efficiency and the effective handling of traffic demand. Main traffic management services include collective information provision on traffic conditions, incidents, roadworks, weather and road surface conditions, and incident management.

**The principle effort** is on providing main traffic management services and on the real-time monitoring needed for these services. The real-time traffic and road condition monitoring and the relevant data management systems are also important for the providers of commercial and value-added services.

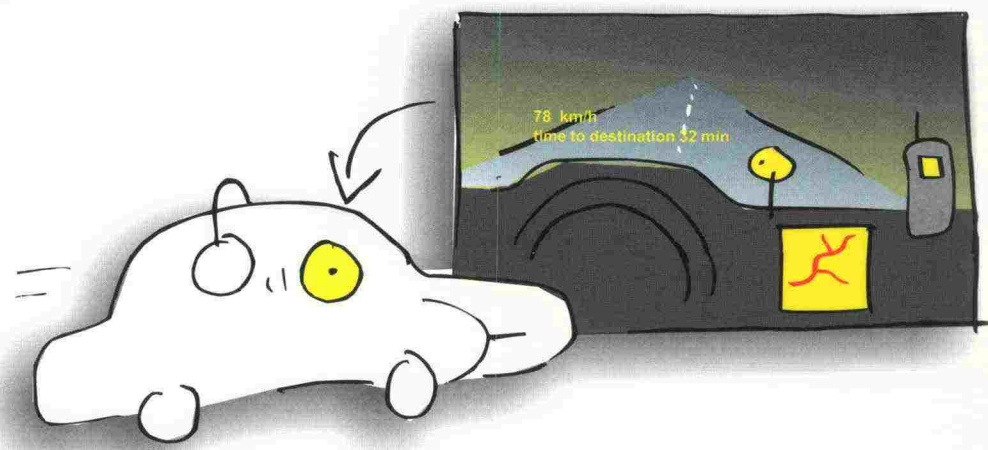
Besides traffic information and demand management, key functions from the **traffic safety** point of view are intelligent speed adaptation and automatic enforcement of compliance of speed limits, traffic signals and lane control. Lane control will be used at specific locations.

**Signal control** is an important function for safety and efficiency on public roads and especially on the streets and road networks of cities.

**The quality of services** will be kept high. Quality criteria are set for all functions based on the operating environments. Services and functions will not be taken into use before they are proven to be reliable and of adequate quality.



Information technology is becoming an essential part of modern traffic



## PROVISION OF SERVICES

Finnra has a thorough knowledge of the status and operation of the road transport system. It provides the main traffic management and control services either through its own personnel or on a commission basis, and leaves individualised information and other services to commercial actors. Emphasis is also placed on co-operation with the authorities, municipalities, transport operators and service providers. Service providers are responsible for the quality of service.

**Finnra is responsible for** the provision of essential information services collectively, incident management and monitoring in co-operation with other actors. It is also responsible for traffic

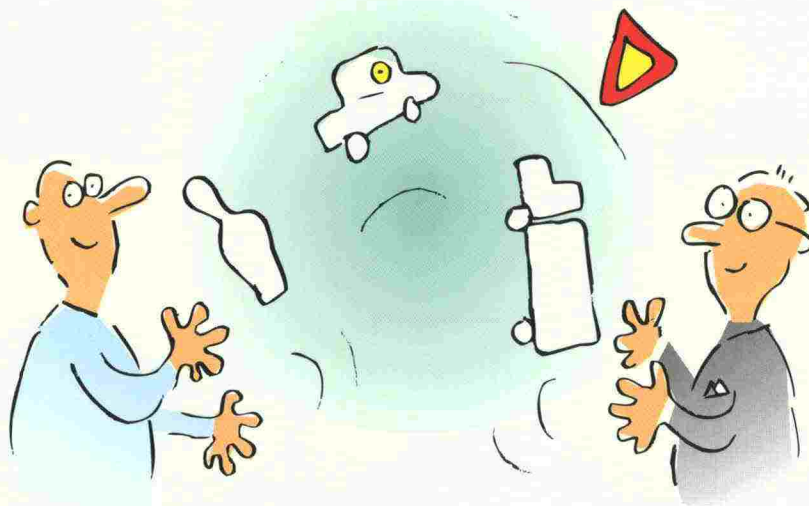
control on public roads, and on other roads on a contractual basis when necessary. Once their content and quality criteria are considered to be stable, services can be commissioned from service providers.

**Providers of commercial and value-added services** will provide customised and individualised information services. Finnra will make real-time traffic data available on its data systems for service providers. Service providers will also be allowed to collect real-time monitoring data with their own means on public roads, provided this does not interfere with traffic. Leaving individualised services to the realm of commercial actors would mean, for example, that the Road User's Phone Service would become an incident-report channel. Possibly commercial services would cover only part of

the country, in which case Finnra could assist in increasing their geographical coverage.

**Co-operation with different actors is central** to the provision of services. The police, rescue centres and other authorities all play important roles in incident management. The municipalities and transport operators have important roles in the areas of traffic and demand control. Models for co-operation should be developed promptly in regard to co-operation rules, areas of responsibility and the interrelation between public authorities and private actors.

**The service provider is responsible** for the quality of service. Finnra is not responsible for e.g. misinterpretation or wrongful use by the provider of information offered by Finnra.



## RESOURCES AND ORGANISATION – CO-OPERATION IS ESSENTIAL

Finnra plays an important role in ensuring the existence of sufficient expertise on traffic management in Finland. Human resources within traffic management will be increased. The main focus in research and development is on studies of new systems, their cost-effectiveness and socio-economic feasibility. Finnra's road regions and central administration will work together in close co-operation.

**Sufficient expertise on the part of Finnra and its partners is a fundamental requirement** for the development and implementation of traffic management systems and services. Traffic management services and functions defined in Finnra's traffic management policy will require more human resources

in the future. Shortage of traffic management experts is a severe problem to which study programs at universities of technology will hopefully provide a solution at some stage in the future.

### **Traffic management is still in the development phase.**

Resources have to be allocated for research and development (R&D) of traffic management. The European Commission has pledged to support the R&D of traffic management at least until 2006 through its TEN-T programme. Finnra's own R&D is in line with Finnra's traffic management policy. The emphasis will be on applied research particularly in the area of new systems, their cost-effectiveness and socio-economic feasibility, as they form the basis for decisions on traffic management implementations. The fundamental research falls within the purview of the universities and research institutions.

**Participation in international and domestic co-operation is useful.** In international programmes it is especially important where in addition to the exchange of information and experience there is also financial support. Finnra plans to engage actively on the domestic level in telematics programmes by the Ministry of Transport and Communications and, on a wider scale, in international standardisation work.

Finnra's road regions carry out the implementation, use and maintenance of traffic management systems, while central administration is mainly responsible for R&D. **Close co-operation and networking of experts is crucial.** Development requires adequate resources and a wide discussion forum. Organisational centralisation of tasks will promote building up of expertise.

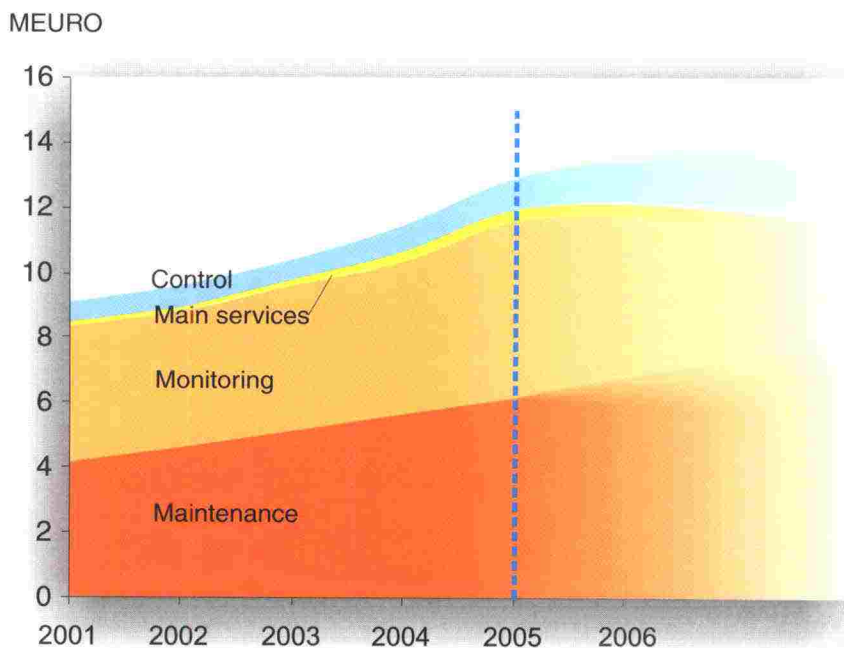


## FUNDING - FOCUS ON THE DEVELOPMENT OF TRAFFIC AND ROAD WEATHER MONITORING SYSTEMS

Finra's continued role as the owner of real-time transport and road weather monitoring systems requires that funding will be channelled towards real-time data collection and information management systems. This will ensure the provision of high-quality traffic management functions. Finra provides information on the road transport system to commercial actors in order to promote the development of these markets.

In the report "Guidelines for road management and development 2015" traffic management has been allocated 8.4 MEUROs per year. In addition to this traffic management is funded by other road management functions such as enlargement investments and new investments. The envisaged funding of traffic management (figure below) will not make it possible to fulfil the vision described in the traffic management policy by 2015. It is estimated that implementing the

traffic monitoring system on the trunk road network alone will require at least 50 MEUROs. This level will not be achieved during the next five-year period without additional funding. The quality objective will be attainable earliest no sooner than 2009, forcing implementation of traffic control systems to be minimised. The maintenance costs of traffic management systems will certainly increase and this funding must be assured.



**Funding of traffic management functions for 2001-2005 according to Finra's action plan for the next 4 years.** The need for traffic management funding will increase. At first emphasis will be on real-time traffic and road weather monitoring systems, later on the provision of services and traffic controls systems. Maintenance costs of traffic management systems will increase.

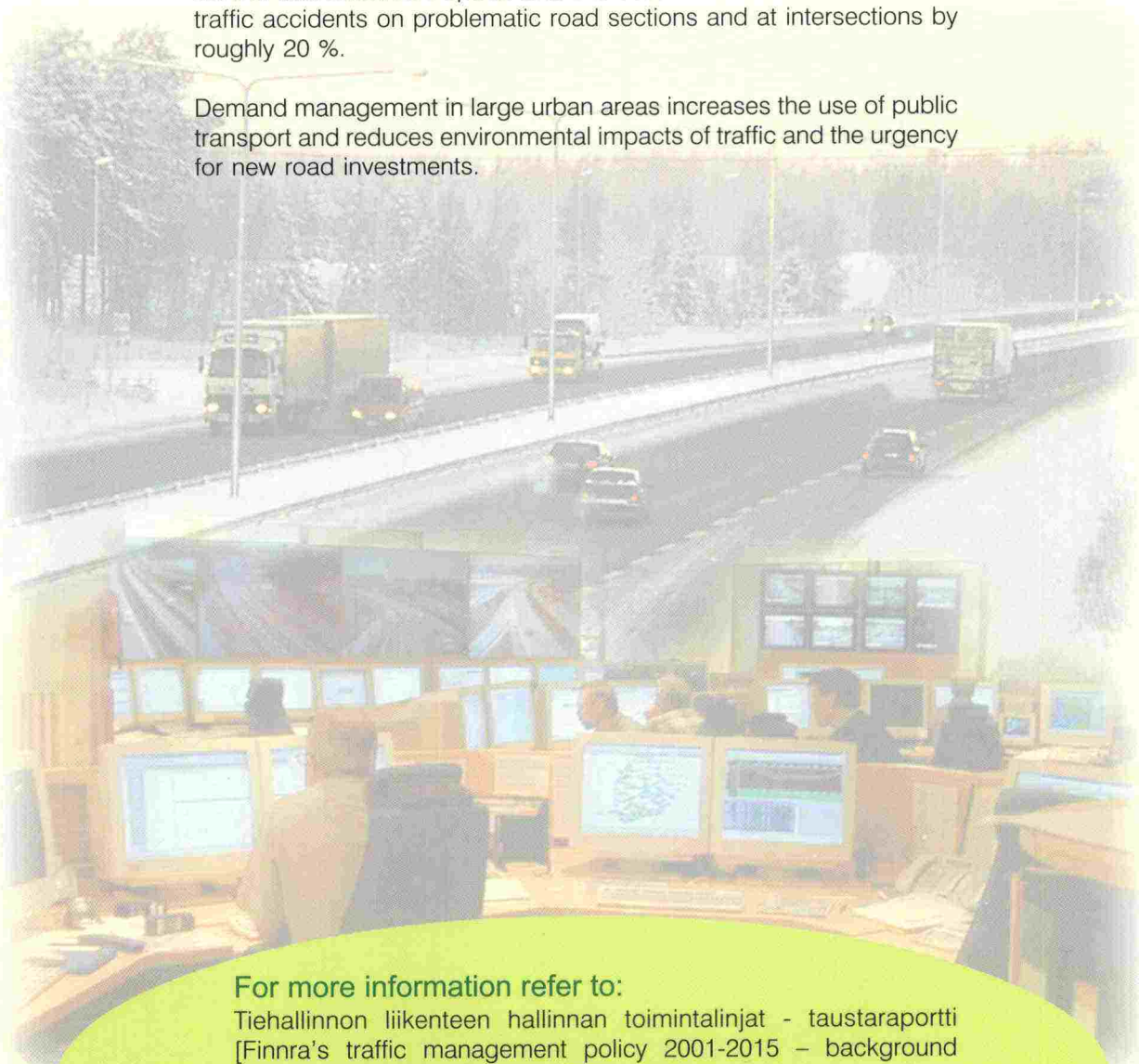
## IMPACTS

At present, the main traffic management services (information collectively and incident management) on the trunk road network are in a satisfactory state only as regards road weather monitoring. The main traffic management services and the high-quality real-time monitoring system required by these services will have the following impacts:

- Traffic information will reduce congestion, cut travel times and increase travel comfort.
- Effective incident management will reduce congestion and cut travel times.
- Travel time reliability will increase, making logistic processes more efficient.
- Main traffic management services will have a positive effect on traffic safety.

Speed-related traffic control and in-vehicle systems, traffic signal control and automatic speed and intersection enforcement all reduce traffic accidents on problematic road sections and at intersections by roughly 20 %.

Demand management in large urban areas increases the use of public transport and reduces environmental impacts of traffic and the urgency for new road investments.



### For more information refer to:

Tiehallinnon liikenteen hallinnan toimintalinjat - taustaraportti [Finnra's traffic management policy 2001-2015 – background report]. ISBN 951-726-708-8, TIEH 1000033-1

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