



Finnra

Moving towards sustainability

Environmental development and policy of the
Finnish National Road Administration



Helsinki 1996

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Introduction

This report presents the activities and development of the Finnish National Road Administration (FinnRA) in regard of the environment and sustainable development.

The report is published in conjunction with the revision of FinnRA's environmental policy. A task force, led by Director Jukka Isotalo and with Architect Anders HH Jansson as secretary, has developed the environmental policy, goals 2005 and action plan 1997-2000, in consultation with regional road administrations, central road administration units and service units, and the national partners of the administration. The policy and goals 2005 were adopted by the Board of FinnRA in May, 1996.

The report was prepared by Mr. Anders HH Jansson, at the FinnRA Traffic and Road Engineering Unit.

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Helsinki, May 15, 1996
Finnish National Road Administration

Jukka Isotalo
Director of Planning

A **ENVIRONMENTAL ASPECTS OF ROAD TRANSPORT IN FINLAND**

With 5 million inhabitants and an area of some 0.3 million km², Finland is a large, sparsely inhabited country. 70% of Finland's area is forest, 18% lakes and wetlands, while built-up and agricultural areas together take up 12%. Consequently, the environmental problems of land use are not very extensive. Congestion of roads is minor and limited to the immediate vicinities of the major urban areas. Other pressures on the natural environment are also moderate. On the other hand, the Finnish natural environment is very sensitive to disturbance, due to the long winter period.

Size and low density lead to long distances and increase dependence on car transport. 94% of passenger transport and 66% of goods transport used roads in 1994. 2.1 million cars and trucks produced a total mileage of 27 thousand million km on public roads, 45 thousand million km on all roads. On an average, Finns travel for 1 hour and 17 minutes daily, at an average distance of 51 km.

Though public transport has a substantial role in Finnish local transportation, due to efficient bus services, complemented by tram, metro and local trains in the Helsinki region, the small scale of most urban areas limits the possibilities to increase its share of passengers.

The overriding global problems of traffic are energy and materials use and the role of exhausts in the greenhouse effect. These problems can only be tackled through international co-operation and there the great car producing nations have a serious responsibility. In Finland, we follow this co-operation and take part in it through a wide range of international organizations.

On the national level, the principles of sustainable development mean, among other things, that we should try to develop our entire society to use less energy, less materials and produce less waste and pollution. We need a more efficient urban structure, a more rational system of transport and a willingness to refrain from harmful consumption. Development is in its early stages. We cannot, for instance, expect car traffic growth to stop before 2015, at the earliest.

On the regional level, the road network and the main roads are very important. By intensifying cooperation between the road administration and local planning administrations, it is possible to guarantee that new roads and road improvement serve the needs of the region and do not damage any important qualities of environment.

The planning of individual road projects has a regional, but mainly local importance. For the local environment, the question of whether a road is built and where it is built, is paramount. Mostly, problems of road building arise out of local environmental concerns. Traffic noise is mainly a local problem, as is preservation of environmentally important areas and landscaping quality.

The effects of road maintenance are also mainly local. A special problem in Finland is the need to use salt to avoid ice formation. The salt spreads to vegetation and groundwater. Other questions of maintenance concern landscape and greenery areas and their upkeep.

In general, the most difficult problems to solve are on the policy level, arising out of the level of energy and materials consumption as well as exhausts of a car-bound society. Low-density habitation and long distances limit the alternatives possible. At the same time, a moderate intensity of land use aids in solving regional and local environmental problems.

B

THE ROAD ADMINISTRATION AND THE ENVIRONMENT

The Finnish National Road Administration develops and maintains the public road network to ensure safe and efficient transport. The road network is a fundamental part of infrastructure. Road administration activities cause many kinds of direct impacts on the environment, as well as indirect impacts, generated by road transport and its effects.

The Road Administration serves society's transport needs and road users. The focus has been on the needs of continuously growing road transport. A high level of service has been achieved, but the environmental damage caused by, among others, road transport and the roads themselves has increased at the same time. In its 1994 action program to reduce the adverse effects of transport to the environment, the Ministry of Transport and Communications states:

"Implementing sustainable development is to be the basis for planning the transport system and managing traffic. The goal is a significant, long-term reduction of traffic-related damage to the environment."

Significant reduction of traffic-related environmental damage demands a sustained effort. Many changes are slow. It is thus essential to choose a policy which makes such changes possible, even though no crucial results may be achieved in the short term. In addition to reducing damage, planning, design, construction and maintenance should aim at creating a durable environment. One can set ambitious goals for the road environment, create something valued also by future generations.

The first environmental policy of the Road Administration was adopted in 1982, the second in 1992. The 1996 environmental policy is based on a revision of the 1992 policy. The policy guides development of the Road Administration's activities, together with other policies.

According to a Transport Ministry task force proposal, the Road Administration will be reorganized, as an administrative and a production organization. Implementation of this proposal means that the new administration will be responsible for the environmental policy. The administration's contracts implement the policy in practice. When considering bids, the administration will take the contractor's environmental management into account as a factor.

The production organisation will develop its own environmental management system.

C ENVIRONMENTAL POLICY OF THE ROAD ADMINISTRATION

The Road Administration acts and develops its activities in accordance with the principles of sustainable development. The administration is responsible for road management and its environmental impacts and for its share of the environmental impacts of road transport.

Each employee of the Road Administration bears responsibility for implementing the environmental obligations and objectives in their own sphere of activity. The administration trains, guides and motivates its personnel to responsible action with regard to the environment, health, safety and economy.

The Road Administration develops transport system planning in extensive co-operation with all those involved. An interaction is sought between the transport system and the environment that contributes to developing a sustainable regional and community structure.

New and reconstructed roads are adapted to their environment. The aim is a safe, functional and beautiful road environment.

The Road Administration improves its environmental management system. Road construction and maintenance will use the best available economically viable environmental technology.

The Road Administration monitors and evaluates the quality and environmental impacts of its activities, and reports on them to the public and the authorities. On the basis of the evaluation, the administration continuously develops its activity.

D

ENVIRONMENTAL GOALS 2005

The Road Administration acts and develops its activities in accordance with the principles of sustainable development. The administration is responsible for road management and its environmental impacts and for its share of the environmental impacts of road transport.

Sustainable development means satisfying the basic needs of humanity in a manner that allows future generations to satisfy their needs. The nature of growth must be changed so that it does not endanger the environment or cause waste of natural resources. Fundamental resources must be protected and strengthened, technological development trends changed as necessary and the risks of technology brought under control.

Ecologically sustainable development is compatible with nature, its functions and diversity, and with the supply of natural resources.

Economically sustainable development implies using less resources for production, improving the quality and durability of products.

Socially sustainable development allows people an increasing and stronger role in managing their own lives.

Culturally sustainable development is compatible with the culture and values of the people participating in it.

Society changes continuously, and thus the goals and objectives set by sustainable development. At present, ever wider international contacts, environmental conventions and agreements, and the environmental and transport policies of the European Union influence our tasks to a significant degree. Finland's environmental legislation evolves rapidly. The Road Administration must develop its activities to respond to the challenges arising. Our activity must find its place in relation to the needs to develop other transport modes and to the resources available.

The Road Administration manages and develops public roads. Our goal is to offer all road users safe and functional mobility: car and truck users, bus passengers, cyclists, pedestrians, disabled people and others whose movement is impaired. The direct responsibility of the administration concerns how the road network is planned, designed, built and maintained. Together with others concerned, the Road Administration carries responsibility for the impacts of road transport and develops environmentally compatible solutions.

An environmental action plan 1997-2000 has been formulated, based on the environmental policy. The plan serves the units' own planning. The units assess the environmental impacts of their activities, set the objectives for developing the activities and plan the actions needed.

1 RESPONSIBILITY AND SKILL

Each employee of the Road Administration bears responsibility for implementing the environmental obligations and objectives in their own sphere of activity. The administration trains, guides and motivates its personnel to responsible action with regard to the environment, health, safety and economy.

Goals 2005:

1.1

Each Road Administration employee is aware of environmental policy, the environmental impacts of their work and what can be done for the environment. The administration supports the knowhow and skills of its employees through systematic training. It also motivates personnel to participate in relevant external courses and takes initiatives to develop professional education in the field.

1.2

One of the directors of the Road Administration is responsible for environmental concerns and each unit has a coordinator in charge of these. Those in charge of the environmental concerns have the relevant training and experience. The employees bear responsibility for the environmental aspects of their own work.

1.3

The Road Administration supports innovations, campaigns and competitions to develop new environmentally sound solutions. The road environment award competition is developed into a periodical review of the environmental quality of the management of roads and streets.

2 THE INTERACTION OF TRANSPORT AND THE ENVIRONMENT

The Road Administration develops transport system planning in extensive co-operation with all those involved. An interaction is sought between the transport system and the environment that contributes to developing a sustainable regional and community structure.

A balance is needed between negative and positive impacts of transport. The Road Administration supports development of public and non-motorized transport and environmentally adapted goods transport chains. Other solutions than building new roads are also sought.

Goals 2005:

2.1

The Road Administration co-operates with environmental agencies and regional development associations to co-ordinate road plans and regional environment plans.

2.2

The Road Administration focuses on co-operation between transport modes and efficient use of the existing road network. The administration is active in co-operation to make urban region transport system plans. The planning objectives are to reduce transport energy consumption and environmental damage, ensure public transport service levels and improve the safety and service level of pedestrians and cyclists.

2.3

The Road Administration develops road planning and design schedules to improve co-operation with land use planning, and offers its own expertise for use in planning.

2.4

The Road Administration takes the impacts on energy use, noise and exhaust emissions into account when deciding on traffic management and speed limits. In areas where noise or pollution level limits are exceeded, mitigating measures are taken.

2.5

The Road Administration, in co-operation with other providers of road user information, presents the environmental and safety impacts of traffic modes, driving manners and vehicle maintenance, and participates in projects offering road users environmentally compatible choices.

3 ADAPTING ROADS TO THE ENVIRONMENT

New and reconstructed roads are adapted to their environment. The aim is a safe, functional and beautiful road environment.

There are demanding environmental objectives for building a road or reconstructing an existing one. The road should be beautiful and offer a meaningful experience of its environment.

Goals 2005:

3.1

The Road Administration maintains biological diversity and avoids or mitigates long-term, irreversible changes. Road environment landscape maintenance supports biological diversity. The administration develops methods of natural landscaping. Special care is needed in the sensitive nature of Northern Finland and the Archipelago.

3.2

The Road Administration adapts the design of its projects to the landscape and townscape. The values of important landscape regions and the cultural heritage are taken into account. New roads in nationally important areas are avoided.

3.3

Road Administration projects support the integrity of urban areas and promote safe mobility. Urban roads are implemented in co-operation with local authorities without hindrance of administrative boundaries; pedestrian zones are created for central areas. Main roads in cities and towns are designed to adapt to the urban scale.

3.4

The Road Administration sets clear objectives for the design of the road environment. Roads, bridges, noise barriers and road appurtenances form an entity, but each stretch of road needs its own objectives, as traffic characteristics or its environment change.

3.5

The Road Administration includes noise abatement and other protective measures in new project design and implementation. Together with inhabitants and road users, it studies possible conflicts between concerns of protection and beauty and seeks a consensus on these. In co-operation with other authorities, inhabitants and land owners, the administration implements its action plans for environmental protection and enhancement on the existing road network.

3.6

The Road Administration ensures the environmental quality of objects and areas important for road services, tourism or experiencing the road environment.

4 ENVIRONMENTAL MANAGEMENT

The Road Administration improves its environmental management system. Road construction and maintenance will use the best available economically viable environmental technology.

An efficient environmental management system safeguards implementation of the goals.

Goals 2005:

4.1

The Road Administration systematically assesses the environmental impacts of its projects, plans, designs and policies and ensures that essential environmental demands, identified by the assessment, are met.

4.2

Environmental management systems are included in the quality system in all units of the administration. Contractors and suppliers are obliged to use systematic environmental management.

4.3

The Road Administration uses environmentally compatible materials, products, methods and techniques. Their environmental impacts are assessed taking their whole life cycle into account.

4.4

The Road Administration develops in-situ construction methods and reduces aggregate use. The administration reduces the number of gravel pits and quarries through improved materials organization and co-operation between interested parties.

4.5

In co-operation with the environmental agencies, the Road Administration monitors groundwater areas in the vicinity of roads where salt is used, ensures that their capacity is not exceeded and implements protective measures, if needed. In co-operation with others responsible, the administration develops management of hazardous transport risks.

4.6

The Road Administration develops its waste management and reduces waste amounts. Polluted area risks are determined.

5 CONTINUOUS DEVELOPMENT

The Road Administration monitors and evaluates the quality and environmental impacts of its activities, and reports on them to the public and the authorities. On the basis of the evaluation, the administration continuously develops its activity.

Goals 2005:

5.1

It is the responsibility of each unit to ensure that its methods, quality standards and directives are up to date and implement the environmental goals.

5.2

The Road Administration studies the direct and indirect impacts of roads and road transport on nature, communities and people. The administration monitors the impacts of projects and its other activities systematically. The monitoring system is a part of the transport sector's information system.

5.3

Research and development serves the environmental goals and its results are efficiently applied. The Road Administration participates in national and international collaborative projects.

5.4

The Road Administration formulates indicators to evaluate its environmental performance. The indicators are part of the road management system. An environmental report is published annually. The development needs and trends of Road Administration activity are discussed with national and regional partners in connection with the report.

5.5

The units of the Road Administration maintain a broad interaction with their partners. Every few years, the administration arranges a discussion on its goals and values.

E IMPLEMENTING THE ENVIRONMENTAL GOALS

The implementation of the environmental goals is outlined in the **Road Administration Environmental Action Plan 1997-2000**, to serve the planning of the units of the administration. For each of the goals mentioned, the action plan proposes a set of measures to be implemented in the period 1997-2000. The measures are defined for the central Road Administration, regional administrations and for the production organization's construction and maintenance activities, respectively.

Sources of the Environmental Action Plan

The environmental action plan utilizes Regional Road Administration environmental policies, the state of the public roads' environment survey and its recommendations for action, and results of FinnRA research and development to specify the measures.

The Regional Road Administrations have developed their own environmental policies since the mid-80's, to answer to national administration goals and the specific needs of each region. Thus for instance, reduction of volatile organic carbon emissions, which is one of the aspects of implementing goal 4.3, includes substituting paints using organic solvents by water-based emulsion paints for road marking; regional administration documents show that this will be accomplished by 1998.

The state of the public roads' environment survey started in 1992 with noise nuisance and groundwater quality surveys. It now includes the quality of the urban environment, nature, the cultural heritage and the landscape along the public roads in the whole of Finland. Based on this survey, the regional administrations have formulated priority programs. They are taken up in goal 3.5 and their implementation comprises, among others, the following actions:

- annually, the construction of 15 km of noise barriers along existing public roads
- groundwater protection structures along 15 km of existing roads annually
- 10 urban area reconstruction projects and 10 natural landscape protection or mitigation projects annually
- other actions to be implemented in accordance with the respective programs.

One of the strategic projects of FinnRA research and development is "Transport and Land Use". In this project, transport system planning has been developed as a tool to integrate plans and programs for all transport modes and land use planning in urban regions (goal 2.2).

The environmental action plan proposes that by the year 2000, transport system plans should be under way for all Finnish urban regions with more than 50 000 inhabitants.

Some sample measures of the Environmental Action Plan

Commitment on all levels of the organization is essential to implementing any goals, let alone the exacting demands of environmental quality. The measures related to goal 1.1 emphasise training and interaction to develop environmental awareness and each employee's environmental skills. For goal 1.2, the responsibilities of management, co-ordinators and environment specialists are defined. The measures of goal 1.3 include developing the road environment award competition in co-operation with local authorities, introducing a regional administration environment improvement award, and fostering environmental innovation.

The results of the second FinnRA road environment award competition will be presented in September, 1996. This time, the subject of the competition is roads in urban areas. The Regional Road Administrations entered 20 proposals. Developing the competition entails extending it to local authority roads and streets and private roads; a corresponding initiative has been made by the Finnish Road Association.

Local authorities traditionally have a strong, independent role in Finnish government. While ensuring local representation, resources and responsibility, this also means that the success of infrastructure development depends on how it is co-ordinated with local authority policies. There are 455 local authorities in Finland. Each has full responsibility for land use planning in its area. One precondition for adoption of a road's final engineering design is that it conforms to town plans in force for the area.

Integrating road planning and design with land use planning thus demands close co-operation between the Road Administration and the local authorities. In addition to the transport system planning initiative mentioned above, this is expressed in goal 2.3, "the Road Administration develops road planning and design schedules to improve co-operation with land use planning, and offers its own expertise for use in planning". The measures of the action plan are:

For the central administration:

- | | |
|---------|--|
| 1997- | To implement the results of the Transport and Land Use project and the Community Impacts of Road Management project, developing co-operation with others involved. |
| 1997-98 | To develop co-operation methods for road management planning and interaction in project design. |

For the regional administrations:

- 1997- To develop parallel procedures for land use planning and road planning and design. To program planning and design stages to correspond to the needs and procedures of land use planning.
- 1997- To increase expertise on land use.
- 1997- To focus systematically on the integrity of the urban structure in negotiation and statements on town plans and building permits, and to support functional transport networks, appropriate separation of motorized and non-motorized traffic, responsible choice of locations and prevention of new environmental disturbances.

The Road Administration recognizes that the essential decisions on the future development of urban areas are made by the local authorities themselves; we assist that process through our expertise and responsibility.

The importance of *protecting biological diversity* has gained increased notice during the past few years. Road construction has an obvious influence on nature and on species' survival. Public roads are not, however, always the major factor of influence. In addition to 77 000 km public roads, Finland has some 410 000 km other roads, of these 395 000 km private and forest truck roads. But the construction standard and traffic amounts of public roads place them in a class of their own as potential risks to especially animal life. In the Road Administration, a project studying impacts on nature started in 1989. Among others, motorway impacts are the subject of four continuing follow-up studies.

The goal 3.1 includes the statement that the Road Administration maintains biological diversity and avoids or mitigates long-term, irreversible changes. The relevant action plan measures are:

For the central administration:

- 1997- To ensure taking account of important nature areas and endangered species in road management and road network planning. To develop methods to study and support biodiversity and to mitigate changes.
- 1997 To define the principles of a nature protection and enhancement program in the vicinity of roads, together with the environmental authorities.

For the regional administrations:

- 1997-2000 To implement, based on the public roads' natural environment survey (1993-96), the road nature program, comprising protection of valuable and sensitive areas (1997-99), management of important areas (1998-) and enhancement measures (1999-).

- 1997- To develop biodiversity aspects of road planning and design in co-operation with regional and local environmental authorities, organizations and experts. To implement design solutions supporting biodiversity.

Construction and maintenance:

- 1997- To develop structures and methods to mitigate or abate long-term, irreversible changes. To minimize damage to flora during construction, protect trees and sensitive plants and avoid major changes in water flows.

Environmental impact assessment (EIA) is a valuable tool in developing environmentally appropriate planning and design. In Finland, FinnRA has taken the lead in applying EIA to its projects. The stipulations of the EIA law were tested in several projects already before the law was adopted in 1994, in close cooperation with environmental and local authorities, civic organizations and the public. In addition to large-scale projects subject to the law, a simplified assessment and design system has been developed for local road projects, ensuring that local environmental concerns will be recognized and taken into account at an early stage. The FinnRA EIA guideline was published in 1992 and revised in 1995-96.

Impact assessment for policies, plans and programs has been developed in cooperation with the Transport Ministry. FinnRA participated in the Transport Ministry "Environmental Impact of the Nordic Triangle" task force, which in 1995-96 made one of the first multimodal transport corridor assessments in the TEN network.

In regard of goal 4.1, "the Road Administration systematically assesses the environmental impacts of its projects, plans, designs and policies and ensures that essential environmental demands are met", the measures of the action plan are:

For the central administration:

- 1997- To continue development of methods and guidelines for EIA.
 1997-98 To develop environmental impact assessment of programs and road network plans and include assessment in planning.
 1997- To develop methods to ensure the implementation of the objectives defined by project EIA in the construction stage.

For the regional administrations:

- 1997- To perform environmental assessment of all projects at an early stage of design. To develop EIA skills and assessment especially for local scale projects. To reassess previously made designs in co-operation with environmental authorities and correct any deficiencies.
 1999 To apply strategic assessment to road management and road network planning.

Construction and maintenance:

1997- To assess the environmental aspects of design before commencing construction projects. If problems are identified, they are immediately taken up with the administration.

The goal 4.3 introduces *life cycle assessment* (LCA) of road products and procedures. On the production level, EIA and LCA meet to ensure that not only the demands of the specific environment, but also the environmental aspects of proposed construction or other processes are taken into account. Internationally, LCA is as yet a tool under development. FinnRA participates in this development, and is also a member of the Finnish committee on environmental management standardization (the ISO 14000 series). The action plan foresees that life cycle analyses of the major materials and procedures of road construction have been finalized by 1999.

Reducing aggregate use in road construction (cf. goal 4.4) is one of the main objectives of the FinnRA and Technical Research Centre of Finland "Road Bed and Surface Materials" program (TPPT, 1994-2000). In addition, the "Environmental Technology" program of the Finnish Ministry of Trade and Industry includes development of industry by-product and waste materials use in road construction. FinnRA participates in the "Recycled road" project of this program.

Continuous development is the subject of goal 5.1. The Road Administration uses benchmarking techniques, auditing, monitoring and environmental quality indicators (cf. goal 5.4) to give development a firm basis of experience and data.

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