E18 MOTORWAY BETWEEN MUURLA AND LOHJA

Non-technical summary of the Environmental Impact Assessment

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Summary

Highways 1 and 7, together with Ring Road III, form the European Road E18 running along the southern coast of Finland from Turku via Helsinki to Russia. The international nature of the road has been emphasised during the past few years. The road is a part of the so-called Nordic Triangle, one of the most important infrastructure development projects of the European Union, and of the proposed Pan-European main traffic network, the Trans-European Network (TEN).

Nationally, Highway 1 unites the urban regions of Helsinki and Turku, and its impact on traffic covers southwestern Finland. The highway has great significance for the development of the urban areas and population centres located along the road.

Traffic on Highway 1 is congested, and its technical features are inadequate with regard to traffic safety. An exceptionally large share of the growing traffic consists of lorries and trucks, which cause traffic bunching. Highway 25 at Lohja is also congested and unsafe; the road serves as the entry route to Lohja, and its traffic is a combination of transit traffic and local traffic.

Method of evaluating the environmental impacts

The present evaluation of environmental impact is connected to the method of evaluating the environmental impacts drafted on the basis of Finnra's plan to construct Highway 1 as a motorway between Lohja and Muurla. The Act on the Evaluation Method of Environmental Impact, which entered into force in the autumn of 1994, entails that whenever a decision is made to implement a project with major impact on the environment, the environmental impact shall be examined in a sufficiently profound manner. This Act is applicable to all motorway projects, among others.

Finnra's Turku and Uusimaa Regions are responsible for road management between Lohja and Salo. It has been agreed that Finnra's Uusimaa Region is responsible for the project and the Uusimaa Environment Centre will act as the contact authority, arranging and coordinating the evaluation procedure.

Phases of the evaluation procedure and the citizens' possibilities of becoming involved

The evaluation programme explains the intended implementation of the evaluation. The Uusimaa Environment Centre put the evaluation programme on display and requested statements on it from different parties. During the period the programme was on display, the citizens had an opportunity to express their opinion on the reports concerning environmental impact. The Uusimaa Environment Centre issued a

statement on the evaluation programme, and the planned evaluation was complemented on the basis of the statement.

During the evaluation process, Finnra has held discussions with the following authorities: Regional Councils of Uusimaa and Southwest Finland, regional environment centres, the National Board of Antiquities and provincial museums, and the State provincial offices and the municipalities in the evaluation area. To complement the information, Finnra has been in contact with different interest groups, such as regional rural livelihood associations and game management districts, as well as nature protection districts and associations.

The evaluation report is on display in the municipalities of the region and at Finnra during the late summer and early autumn of 1996. Presentations have been given in Lohja, Nummi, Mustio, Suomusjärvi, Kisko and Salo, and the citizens had an opportunity to express their opinion on whether the evaluation has been carried out accurately enough and whether the report presents the impact on the different alternatives in a comprehensive manner.

Alternatives studied in the evaluation method

The two main studied alternatives are: constructing a motorway from Lohja to Muurla, and not constructing the motorway - in other words, improving the existing road network.

The motorway option is an alignment for which Finnra has drafted master plans in the manner prescribed in the 1990 resolution of the Ministry of Transport and Communications. The alignment is a continuation of the motorway from Helsinki to Lohja and bypasses the Lohja urban area alongside the Lohjanharju ridge. From Lohja, the motorway continues through the municipalities of Nummi-Pusula and Sammatti to Suomusjärvi, where the alignment shifts north of the existing Highway 1, crossing the municipalities of Kiikala, Pertteli and Muurla. In Muurla, the alignment is joined to the Paimio–Muurla motorway section. The construction of this section had begun in 1997. The motorway from Paimio to Turku is finished. The length of the motorway alignment to be evaluated is 63 km from Lohja to Muurla. There are two alternatives for the motorway in the Karnainen area, west of Lohja: an open cut alternative and a tunnel alternative, where a tunnel of approximately 2 km runs underneath the Karnainen area. The motorway alternative also includes the eastern entry route to Lohja, from Lempola to the Suurlohjankatu street leading to the centre of Lohja.

If the motorway is not constructed, the existing road network must be improved. The point of departure for planning the improvement of the existing roads has been to avoid heavy improvements with significant environmental impact, such as a motorway. In this case, objectives concerning traffic are subject to compromises. The main targets in this case are improvement of the current Highway 1 from Lohjanharju to Muurla, improvement of Highway 25 at Lohjanharju from Muijala to Suurlohjankatu street, and improvement of main road 186 (Inkoo-Kisko-Salo), which has frequently been suggested as the substitute route. Highway 1 will remain a single-carriageway (two-lane) road for mixed traffic, improved with overtaking lanes and other measures. The planned improvement measures include widening the road, improving the alignment, reducing intersections and additional turning lanes, as well

as construction of road lighting and parallel roads. The speed limit on the road varies from 60 to 100 km/h.

If the motorway plan is not implemented, another carriageway (totally four lanes) must be constructed on Highway 25 at Lohjanharju (from Muijala at least to Suurlohjankatu street leading to the centre of Lohja). The intersections of the road are either at-grade intersections or grade-separated intersections. The speed limit on Highway 25 varies from 70 to 80 km/h. In conjunction with the improvement, the number of intersections will also be reduced and parallel roads constructed.

Considering the existing traffic and the possibility of transferring traffic, there is less need for improvement to main road 186 than Highways 1 and 25. Plans have been made to improve the road with fast lanes (four pairs of fast lanes), refurbishing the road landscape at the Toija population centre, and making certain arrangements with intersections and bicycle and pedestrian routes.

To reduce the need for improvement of Highway 1 by transferring traffic to main road 186, the amount of transferred traffic should be such that it would cause congestion on main route 51 between Kirkkonummi and Inkoo. Such a traffic flow does not naturally transfer from Highway 1. Instead, also the traffic for which Highway 1 would be a shorter route would be directed to main route 186. Therefore, extensive improvement to main route 186 cannot be fully utilised without transforming main route 51 into a four-lane road, and these measures are too expensive to be profitable. For these reasons, this review proposes a solution by which improvements to main route 186 are minimal.

Both the motorway alternative and the alternative of improving the existing road network are based on the assumption that the motorway from Turku through Salo to Muurla and the eastern bypass of Salo are constructed. At the time of the review, the traffic forecasts represent the situation in 2020. The measures for reducing adverse effects in both alternatives have been examined. Measures for reducing adverse effects include the construction of tunnels or landscape bridges, protection of ground water, and noise protection, as well as plants and landscape design.

What has been examined earlier, what during this evaluation procedure
This evaluation process focuses on evaluating the impact at the national and regional levels, since the impact of the motorway alignment on its immediate environment has already been extensively examined in conjunction with the master plans drafted for the motorway.

In conjunction with the evaluation procedure, the earlier reports and forecasts on which the estimates of impact have been based have been reviewed and updated. Complementary reports have been drafted for some areas.

Preliminary plans for improving the existing road network have been drafted. Complementary reports for the natural sites along the existing roads have also been made. Landscape surveys complementing the earlier ones were made in the Raati village in the summer of 1995 in order to specify the current status of valuable natural sites and to evaluate the impact on the water balance of the Laiskalampi pond.

Groundwater surveys were specified, particularly in the Lohjanharju area. The amount and effects of transportation of hazardous cargoes were also examined.

The reports on the impact of noise and emissions were further specified. In order to assess the social impact, a survey was carried out among the permanent residents and summer residents. The results of the survey were complemented with interviews.

Landscape analyses of the valuable landscape areas along the existing roads were performed. Moreover, a complementary landscape analysis was conducted in the Raati village landscape area in order to further specify the impact of motorway alignments, examined earlier, on the landscape.

The impact on the structure of the region's communities and the commercial and industrial activities of the region was studied by means of future development paths (the scenario method), estimating what kinds of factors increasing economic growth the project alternatives would generate. The reports examined the project’s impact on the creation of new jobs and changes in the status of the municipalities in the region.

The land use report examined the current state of the urban planning and land use, the impact of the project on the municipalities and parts thereof, and the scale of the impacts. The report distinguished impacts at the regional, municipality-specific and local levels.

Comparison method

The emphasis of the examinations has been on the impact caused by the construction and use - that is, traffic - of the road. The evaluations are based on the assumption that the road will be completed in 2010. The basis for the traffic economy surveys was the 30 years following the date on which the road is completed. The assumed total service life of the motorway is 50 years.

The evaluation focuses on examining the impacts defined in the Act and Decree on the Evaluation Method of Environmental Impact, Furthermore, the evaluation comprises the relevant traffic-related, technical and economic effects for comparing the alternatives, since the master plans of the motorway have been drafted in small parts and lack comparison with the alternative of improving the existing road network.

The significance of the impact has been evaluated by describing the changes caused by the two alternatives in comparison with the current situation. The extent of the changes has been evaluated separately for each entity in co-operation with experts from the different sectors and interest groups.

Since environmental impacts are not commensurable, they were not combined or measured with each other in drafting the comparison of the alternatives. The comparison was made using a specifying method, where the impact was forecast and described in a manner characteristic of each type of impact. The significance of the various impacts for the project was then examined. The significance of the effects was defined and approved by the team leading the project. On the basis of their significance, the effects were divided into primary, important and other impacts. The comparison of alternatives emphasised the primary impacts.

Impacts on people's health, living conditions and well-being
The motorway alternative will transfer traffic noise to new, sparsely populated areas. At the same time, the noise level along the current highway will be reduced, or at least increased noise will be prevented, as the amount of traffic and its speed will be reduced. In both alternatives, plans have been made to construct noise protection barriers in areas where several households are subject to noise. In the alternative of improving existing roads, the noise level of households close to Highways 1 and 25 will be reduced, and the number of people suffering from noise can be reduced by noise protection. No relevant changes will be made along main road 186. In the motorway alternative, approximately 2,200 people will remain in the noise area with no noise protection, and approximately 1,100 people with the noise protection designed for the motorway. The corresponding numbers in the alternative of improving the current roads are approx. 2,600 and 1,050. With regard to the noise situation, the most important areas are the population centres close to the road: Suomusjärvi, part of Nummi and Saukkola, and Lohjanharju and Toija. The noise situation in the motorway alternative can be considerably improved if separate noise barriers are constructed along the existing roads in the most problematic places. Correspondingly, in the alternative of improving the existing roads, the construction of all planned noise barriers is unsure.

The emissions generated by traffic are approximately at the same level in both alternatives. The amount of emissions will be reduced with the development of fuels and technology in general.

Residents and summer residents have not considered the development of the road a significant issue in their environment, with the exception of residents and summer residents located quite near to the motorway alignment. The attitude towards the planned alternatives has mainly been based on the people's general attitude towards constructing motorways. However, the current lack of traffic safety has been regarded as a significant problem. The survival of services and, thereby, small municipalities along the existing roads has also caused concern. The motorway is expected to enhance the marginalisation and atrophy of these villages.

The motorway alternative crosses the recreation areas of Nahvonjärvi and Suomusjärvi at Suomusjärvi, and the recreation area of the Karnainen upland, although this can be preserved in the tunnel alternative. The improvement of existing roads does not cause changes in the recreational use of these areas.

Impact on nature
The motorway will be located in a new landscape passage and will split several natural entities and areas valuable for preserving biodiversity. Furthermore, the motorway crosses water courses at several points, e.g. in the Lohja lake area and the Kiskonjoki water course, which have been classified as valuable natural entities. The improvement of existing roads will not cause significant changes in the natural environment.

Groundwater is at risk of pollution in the groundwater areas of Lohjanharju and Kitula. In the motorway alternative, these risks are prevented by constructing groundwater protection. There are also many groundwater areas along the existing roads that will be protected in the improvement alternative. Overall risks will be

reduced in both alternatives. The motorway alternative increases risks concerning groundwater at three water intake plants, but the length of the road on groundwater areas and the risk of traffic accidents are lower than in the alternative of improving existing roads.

The construction of the motorway in varied terrain requires high rock cuts and embankments, as well as substantial heaping of excess masses. Heaping areas may change the current status of minor water bodies. The improvement of existing roads requires only a few changes involving the ground.

Flying squirrel

In 2001 Finnra ordered a report on flying squirrels for the entire road section from Muurla to Lohjanharju. The species is included in Appendix 4A of the EU's nature directive on species requiring particular protection. According to the report, 47 occurrences of flying squirrels were located close to the future highway, of which 29 were in the immediate vicinity of the road. After various mitigation measures, it was stated that one site of the flying squirrel's reproduction and resting places would be destroyed by the road and six of them deteriorated. As a consequence, Finnra applied for a total of seven exemption orders from the Environment Centres of the Uusimaa region and south-west Finland. The exemption orders were granted on 20 June 2002. However, appeals were submitted first to the Helsinki Administrative Court and later to the Supreme Administrative Court. The Supreme Administrative Court dismissed the majority of the appeals on 31 December 2003, after which date the exemption orders have been legally valid.

Recently, a twig nest of the flying squirrel has been found in the Näpönsuo area of the Raati village of Nummi-Pusula. The new application for an exemption order concerning this finding was submitted to the Environment Centre of the Uusimaa Region in February 2004. The exemption order is expected to be issued at the beginning of the summer. Appeals have been filed to the Helsinki Administrative Court, which has dismissed them. No appeals have been filed to the Supreme Administrative Court by the date of expiration.

Impact on communities and land use

The motorway alternative will change the community structure by supporting the creation of new business activities and business relocation, particularly in Lohja and Salo. The road's impact on business life was estimated by examining the increase in new jobs, which in Lohja is approximately 40 and in Salo some 20 jobs annually. In other municipalities the growth is expected to be minimal. The alternative of improving the existing roads would not have a relevant effect on the number of jobs.

The construction of the motorway will improve connections between municipalities, and connections between population centres and villages along the current Highway 1 will be facilitated. With regard to land use, preparations for changes should be made in the vicinity of grade-separated intersections. The improvement of existing roads does not considerably change land use or urban planning needs.

The construction of the motorway will split the land of several farms. This impact is substantial in the areas of Laperla, Suomusjärvi and Raati. The amount of lost field

surface would be approximately 75 hectares, and lost forest surface approximately 500 hectares. In the alternative of improving the existing roads, the splitting effect of the road is rather small, and depends on the manner of implementing the parallel road arrangements. The amount of lost field surface would be approximately 45 hectares, and lost forest surface approximately 150 hectares.

Impact on landscape and cultural heritage
The construction of the motorway will reduce traffic bypassing the population centres along Highway 1 and enable changing the road to better fit its environment, thereby also improving the image of the population centres. The improvement of the existing roads entails increased transit traffic in the population centres, widened road areas, increased impact of the limiting effect of noise barriers, and a further decentralised image of population centres.

In the new landscape passage, the motorway will change the natural landscape substantially. It will cross, among others, the nationally significant landscape areas of Kruusila and Laperla. In the alternative of improving the existing roads, changes to the landscape are minor and focus on the immediate surroundings of the existing road.

Neither alternative brings the loss of any buildings with architectural or cultural-historical value. There are more known antiquity sites along the existing roads than along the motorway.

Impact on traffic
The forecast amount of traffic on the road section in 2020 is 11,000–15,000 cars per day on Highway 1 and 20,000–23,000 cars per day on Highway 25. Even if the most daring expectations of rail traffic are realised, the amount of traffic on Highway 1 would not be reduced by more than 10–20 per cent. Reduction of traffic by enhancing rail traffic does not essentially reduce the need for improvements to Highway 1. The development of other forms of traffic does not eliminate the traffic-related need for the motorway between Lohja and Muurla.

The motorway alternative would ensure smoothness of traffic, even during rush hours, and improve traffic safety. In the forecast situation, the number of accidents will be reduced by 15 per cent over traffic using the existing roads. This means that approximately twelve accidents leading to personal injury, two of them fatal, could be avoided annually. The construction of the motorway would also considerably improve the situation regarding cargo traffic and long-distance bus traffic. In the motorway alternative, the road network is organised so that long-distance and local traffic are not unnecessarily mixed. This improves the circumstances of local traffic.

Even if the existing roads were substantially improved, there would still be sections with lower speed limits, for instance because of a population centre or intersections. Due to these sections and the large amounts of traffic, a sizeable part of the annual traffic would take place in congested circumstances. This also reduces the certainty of cargo traffic and public transportation services. Entry into the main road may be difficult in rush hours, which would affect the smoothness of local traffic. Possible traffic signals on Highway 25, whilst improving local connections, would impair the smoothness of the traffic on the main road.

No relevant changes will be seen in the current number of accidents, even if the existing roads are improved.

Congestion on Highway 1 may direct traffic to other routes, e.g. main road 186 and Jorvaksentie, which will then also be congested. This would lead to bunching and accidents.

Highway 1 is part of the international European Road E18, planned as a motorway improvement for the whole section from Turku to Vaalimaa. The benefits obtained from developing the entire European Road E18, such as traffic transferring from other routes to a safer, more economical motorway, will not be reached if this section of the motorway is not constructed. This reduces the economic benefits of improvements carried out in other sections.

Comparison of the alternatives
The adverse and positive effects of the motorway are significant. The changes caused by improving the existing roads are generally smaller.

By constructing the motorway, the traffic problems on the current Highway 1 and, particularly, Highway 25 can be solved (risk of accidents, congestion, problems in population centres), and traffic circumstances will improve substantially. With regard to traffic management, improving the existing road network is not nearly as efficient a solution as the motorway. In this alternative, the existing adverse effects of traffic will be increased and mainly directed to the living conditions of people located near the roads. Economically, the motorway is a better alternative than improving the existing road network.

The greatest adverse effects of the motorway alternative are the reduction of biodiversity and splitting of water bodies in the Lohja lake area and the Kiskonjoki water course. Furthermore, irreversible changes in the landscape will occur along the entire alignment, particularly in the cultural environments of Kruusila and Laperla. The adverse effects of the motorway can be reduced in the Karnainen rock area, which can be preserved as a valuable natural and recreational site by implementing the tunnel alternative.

The positive environmental impacts of the motorway present themselves as increased viability of business in Lohja and Salo, and improved image of population centres along the existing roads. The noise caused by the traffic will be transferred to new areas, which are currently quiet. On the other hand, the number of people suffering from noise along the existing roads will be reduced.
The most important adverse effects of the alternative of improving the existing roads are the deteriorated images of the population centres in Saukkola and Suomusjärvi.

The positive environmental impact of the alternative of improving the existing roads is the construction of groundwater protection, which would reduce the pollution risk from the current level.

Monitoring programme for environmental impacts
<u>Introduction</u>

The monitoring programme for environmental impacts is based on environmental impact assessment for E18 road done in 1996. The monitoring needs have become more precise during the evolvement of plans and changes in the legislation.
The monitoring programs have been drawn up separately to the road sections Muurla-Lahnajärvi and Lahnajärvi-Lohja. The main issues of both monitoring programs have been collected in this summary.

On the road section Muurla - Lahnajärvi the environmental effects of the motorway will concentrate on threatened species, groundwater and water systems.

On the road section Lahnajärvi-Lohja the environmental effects of the motorway concern noise, groundwater quality and quantity, water systems effected by bridge construction, the monitoring of the level of the surface of the water of the ponds near the road and the changes in the landscape.
The majority of the monitoring activities that have been explained here will be included in the service agreement of E18 Muurla-Lohja life cycle agreement as tasks of the service provider. The service agreement will be made in the autumn 2005.

Road section MUURLA – LAHNAJÄRVI

Ground water levels
Measuring of the level of groundwater is carried out in the area of the motorway from ground water pipes and wells.

Groundwater quality
Groundwater areas in the sphere of influence of the motorway are the class 1 groundwater areas in Kitula and Kruusila.

Wells and ground water pipes are monitored to state the possible quality changes caused by the construction of the road and by the maintenance of the road. Furthermore, the condition of the slope protection will be monitored in Kitula groundwater area in the spring and autumn. The quality samples of the ground water are taken simultaneously with the measuring of the water level.
Water system monitoring

The water systems by the motorway might result from the oils or chemicals which end up to the water systems in a possible accident. The most critical place is the water system area of Kiskonjoki which belongs to Natura 2000 programme, especially rivers of Kurkijoki, Huitinjoki and Varesjoki flowing to the lake of Aneriojärvi.

Monitoring obligations have not been set to the outlets of clarifier basins. However, the quality of water of the lakes of Syvälammi, Aneriojärvi, Pernjärvi and Siitoonjärvi will be monitored.

Monitoring of the birdlife in the Haukkamäki - Lakiamäki area
The construction of motorway may weaken the endangered woodlark's nesting possibilities in Haukkamäki in Muurla. The effects of the road on the nesting have been considered local because the rock terrain which is suitable for a woodlark continues several kilometres outside the road area.

The purpose of birdlife monitoring is to clarify how traffic noise and another disturbance affect the number of the woodlark's occurrences in the area of Haukkamäki and Lakiamäki. The monitoring is made before the beginning of the construction of the motorway, during construction, in the first spring after completing of the road and after 2-4 years after this.

Changes in the landscape at Laperla and Kruusila
Changes in the cultural environment are monitored in the nationally valuable cultural landscape at Laperla and Kruusila. The monitoring is carried out before the construction, during construction (when the road structures are mainly visible) and after 1 and about 5 years after completing of the road.

Road section LAHNAJÄRVI – LOHJA

Noise
The E18 Muurla-Lohja service agreement does not include the monitoring of the noise situation of the project. Road administration is responsible for the measures which are done due to possible complaints.

Water system monitoring in Talpelanlahti, Hossansalmi and Koivulanselkä
According to the decisions of the Western Finland Environmental Permit Authority the road district of Uusimaa has been obliged to monitor the effects of construction work on the water system in Sepänniemensalmi, Hossansalmi and Koivulanselkä.

The water system monitoring is made before the construction of the motorway, during construction and after construction.

The monitoring after year 5 from completing the road construction will be made, if necessary and it will not be a responsibility of to the service provider of the E18 Muurla-Lohja project.

Water level in Laiskalampi, in the ponds of Karnainen and Hormajärvi
The drainage waters coming from road area are led away from the area of Saarilampi, Syvälampi, Kaitajärvi and Hormajärvi. Because the road project has an effect on the water balance of these lakes, the height of the water level of lakes must be monitored. The height monitoring will continue for two years after the construction.

The water level will be measured from the measuring poles that have been installed in Laiskalampi and in the ponds of Karnainen once a month, to clarify the annual variation of water levels in the ponds. The measuring is continued during blasting work and for 2 years after the construction.

Amount and quality of well waters
The wells within the distance 200 - 300 m from the road were surveyed at the end of the year 2003. Wells placed near the special areas of the road construction (tunnels, open cuttings) were chosen as the monitoring objects of the quality of the ground water. The duration of the monitoring of the quality of the ground water after the construction is 5 years. The monitoring of the ground water level will be continued 1 year after the construction.

Changes in the landscape at Karnainen and Raati
Changes in the cultural environment are monitored in the regionally valuable cultural landscape at Karnainen and Raati. The monitoring is carried out before the construction, during construction (when the road structures are mainly visible) and after 1 and about 5 years after completing of the road.

Lempoonsuo shooting range
Lempola interchange in Lohja is placed on the old shooting range of Lempoonsuo, the soil of which has been contaminated by lead. The purpose is to remove and to isolate the earth which has spoiled with lead and with other metals to the final disposal site which is built on the road area so that the detrimental substances will not cause a danger to health and environment.

The environmental permits given for the excavation work of the contaminated soil and for the final disposal of contaminated soil are valid. The requirements in the environmental permit concerning the final disposal of contaminated soil are the bookkeeping, general monitoring of the masses of the filling area and the monitoring of waters.

Flying squirrel
The objective of monitoring is to estimate the effect of the road on the flying squirrel population. The changes in flying squirrel population are compared with the flying squirrel population on the road area and with the development elsewhere in Finland. The history of more than 70 targets is known before the construction of the road from the time of 4-5 years. With the monitoring it will be analysed what changes result from the road and what changes are caused by other factors.
The monitoring of the flying squirrel population is carried out as a separate project.

Reporting and supervision
Reporting during construction and after construction is included in the E18 Muurla-Lohja service agreement. Reports of the results are compiled before the construction, during construction and after construction. The reports before construction and after construction have to be more extensive than those made during the construction.

A team consisting of the representatives of the environmental centres of Uusimaa and Southwest Finland and the road districts of Uusimaa and Turku will be responsible for the supervision of the monitoring.

Natura 2000 issues
Kiskojoki head waters, such as lakes of Ylimmäinen, Saarilampi and Koskenalainen, are located near the new motorway and they belong to Natura 2000 sites. The new motorway will not effect directly on the conditions of waters or preservation values. However, impurities flowing from the motorway may effect on the natural state of the waters. The risks will be covered by constructing rootstock purifying plants, which can remove heavy metals and other impurities from the flowing water quite well but not all the salt to be used for winter maintenance.