

Private Road Maintenance and Construction in Finland

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Finland uses \$33 million yearly to subsidize the maintenance of 18,000 private or rural roads. The Finnish principle of keeping the whole country inhabited and the rural areas vibrant is one reason private road maintenance is supported. The other reason is to equalize the maintenance costs of private road keepers and those who live along public or local roads. Those living on the same road establish road cooperatives to share the maintenance costs. Government aid covers half of the estimated yearly costs. Experience has shown that people living in Finnish rural districts can be motivated to maintain their access roads if a financial incentive and appropriate legal framework are made available by the government. The maintenance of these roads is economically optimized, and road quality is satisfactory because the people themselves must minimize their own costs and keep the quality high enough for their own traffic. Finland had provided this subsidy and gathered information about maintenance performance, quality standards, and maintenance costs on low-volume roads for 30 years.

Finland has a surface area of 338 000 km² and 5 million inhabitants. The road system includes 105 000 km of private roads in residential areas, 77 000 km of public roads maintained by the Finnish National Road Administration (FinnRA), and 23 000 km of city streets and municipal roads maintained by local authorities. Traffic volume on private roads is ap-

proximately 1000 million km per year, which is 2.5 percent of the total traffic volume in Finland. The average daily traffic (ADT) is 44 vehicles. The ADT on 8500 km of public roads is very low, 55 to 100 vehicles, and these roads may be changed to private roads.

A total of 700,000 permanent residents live on the 105 000 km of private roads and an additional 500,000 use these roads to visit their summer cottages. The transportation of 26 million m³ of lumber, which is 70 percent of the total amount used by the wood industry, begins on private roads and thus has an effect on transportation costs and international competition.

Maintaining the level of service on private roads is important not only for the livelihood of the people and commerce, the wood industry, and agriculture, but also for the standard of living and an increasing amount of leisure time. Outdoor activities such as hunting, fishing, and berry-picking are popular. In areas of scattered settlement the importance of access roads is noticeable since those areas have many private roads. Other aspects include national defense, rescue operations during accidents and natural catastrophes, and nature conservation.

FINANCIAL SUPPORT TO PRIVATE ROADS

Finnish experience begins in 1962, when the government of Finland passed the law of private roads to

equalize the maintenance costs of private road keepers and those who live along public or local roads.

The distribution of the subsidy is organized through FinnRA. Each year the government budget allocates funds for the maintenance and construction of private roads; 60 000 km of a total of 105 000 km of private roads receives this subsidy. In 1992 the total maintenance subsidy was approximately \$33 million, covering 60 000 km on 18,000 roads.

Roads that carry the traffic of at least three permanent residents or that have major public importance locally and are organized into a road cooperative can receive the subsidy. A road cooperative is a private road maintenance organization, either with an established legal framework or without legal definition, whereby a road is maintained by the people living along it and not by any level of government.

The subsidy is distributed by the road districts of FinnRA. The central administration allocates the subsidy to the road districts. The road districts decide whether a road is qualified to receive the subsidy and calculate the amount of the subsidy. Every year the road district pays the subsidy to the bank account of each road cooperative.

Local authorities in the municipalities also offer some subsidies, but since they are discretionary, the amounts and conditions vary. The yearly total amount of the subsidy from the municipalities is as large as the government subsidy.

MAINTENANCE

The subsidy covers an average of 55 percent of the estimated maintenance costs. The maintenance costs are estimated based on the climate, maintenance class of the road, and maintenance standards.

Climatic Area

Finland is divided into three climatic areas, one along the coast, one in central Finland, and one in northern Finland (Figure 1).

Maintenance Class

There is a specific maintenance classification for private roads. All the roads that receive state subsidies are divided into four maintenance classes determined by land use and traffic volume in the area served by the road.

About half of the roads belong to Class 3:

Maintenance Class	Percent of Roads	Length of Road (km)
1	6	3 500
2	20	11 500
3	51	29 400
4	23	13 300

Maintenance Standards

Private roads have specific maintenance standards that contain all the maintenance operations and assign average amounts to the operations. Maintenance standards are defined for all winter and summer maintenance operations: grading, dragging, dust binding, clearing of vegetation, plowing, snow staking, snow and ice grading, and sanding.

The cost estimate can be calculated based on the maintenance class and the location of the road. The cost estimate contains all the maintenance operations and estimated repetitions. For example, grading is not dependent on the climatic area, so it only varies by class:

Maintenance Class	Grading Times/Year
1	2-3
2	2-3
3	1-2
4	0-1

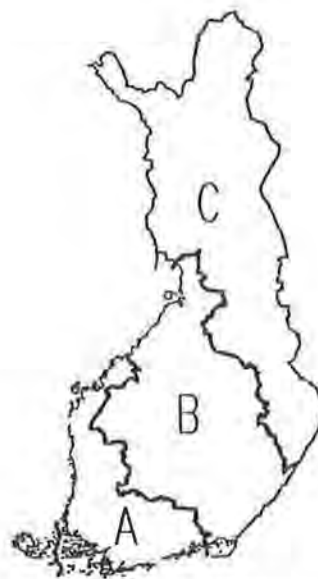


FIGURE 1 Climatic areas in Finland: A, coastal area; B, central Finland; C, northern Finland.

Plowing depends on the area:

Maintenance Class	Plowing Times/Year by Climatic Area		
	Area A	Area B	Area C
1	25–35	30–40	40–50
2	20–30	25–35	35–45
3	10–25	15–30	20–40
4	10–25	15–30	20–40

Road districts send the cost estimate to the road cooperative every year. The road cooperative can suggest changes in the estimate if major repairs have to be made to the road. The suggestions will be considered in the estimate.

The average maintenance costs in the four classes are as follows:

Maintenance Class	Avg Maintenance Cost (\$/km)
1	960
2	720
3	590
4	530

Maintenance costs are estimated, and the road cooperative receives about half of the costs as a subsidy. Usually the road cooperatives share the costs among the members according to predefined portions. The portions are calculated in tons per kilometer—the heavier the vehicle and the longer the distance, the bigger is the portion of the total costs.

Every third year, a technician from the road district visits the area. The road cooperative is informed beforehand about the visit. They can meet with the technician and receive advice on their maintenance problems and information about the subsidy. The technician checks that the conditions for receiving the subsidy are still valid and that the road is in acceptable condition. If the maintenance is not done, the road district can give a time limit to the road cooperative to get the road in satisfactory condition. Otherwise, the road cooperative may have to return the subsidy.

CONTROL ROADS 1985–1989

In 1985–1989, data were collected on control roads to find out how the estimated costs matched the actual costs, how the maintenance standards corresponded to work performance, and how the quality and the maintenance methods have developed. These control roads were randomly selected and reliably represented all the roads. The information was gathered about the same roads in 2-year periods.

The results indicate that there is a difference in the maintenance costs in the four maintenance classes. The difference compared to Class 3 is +25 percent in Class 2, +50 percent in Class 1 and –25 percent in Class 4. So real maintenance costs are relevant to the maintenance classes and maintenance standards. But the amount of work did not vary among the three climatic areas except for plowing, which did not have a significant effect on the average costs compared with the rest of the country. Therefore, there is no need to divide roads by climatic areas in the long term; maintenance costs depend only on the maintenance class, which is based on land use and traffic volume in the area served by the road.

There is a clear correlation between the wearing surface material and the quality of the road. Road cooperatives have used natural gravel because it is cheaper and the distance to the supply is usually shorter. Since 1985 the cooperatives have received advice and information from FinnRA road supervisors. They have been advised to use crushed aggregate (0.18 mm) on the road surface even though it is more expensive. When the use of crushed aggregate increased 15 percent (from 35 percent to 50 percent in 1988–1989), the quality increased from satisfactory to good on 10 percent of the roads. The yearly consumption of crushed aggregate is around 35 m³/km.

QUALITY

There are no standards for the level of service of private roads. The law of private roads states that the road should be in acceptable condition for motorized traffic all year. To estimate the level of service, a local FinnRA road supervisor uses visual inspection to determine three major factors:

- Road surface: surface material quality and quantity, camber, rutting, corrugation, and potholes;
- Drainage: ditches, culverts, and bridges; and
- Shoulders and verges: clearing of vegetation and visibility.

The total quality is determined by weighting the factors as follows: road surface, 45 percent; drainage, 40 percent; and shoulder and verges, 15 percent. All these are scored from 1 to 10. The quality is good if the total points are 7 to 10, fair if they are 5 to 7, (maintenance class 3 and 4: 4 to 7), and poor if they are 0 to 4.

The summaries show that more than 70 percent of the private roads are in good condition, 29 percent in fair condition, and less than 3 percent in poor shape. Since 1985, when FinnRA road supervisors started to visit the road cooperatives every year, the number of

roads in good condition has risen to more than 70 percent. The condition of cooperative roads has reached a level at which additional government financial aid is not needed. Today the road supervisors visit the roads every third year if necessary.

CONSTRUCTION

Construction subsidies are delivered to road regions, which decide what targets are the most urgent and important in their area. Most of these projects are major improvements of bridges, road repair, and some traffic safety improvements. State, municipality, and road cooperatives usually share the cost of each project.

A special program has been created for railway crossings because of the safety problems caused by the growing speeds of trains. All private road intersections with railways have been mapped, and gates with warning lights or underpasses have been constructed.

In 1992, 190 projects received a total of \$8 million in government subsidies. In 1993 financial aid to private road construction was \$10 million; \$5 million was used for employment purposes.

MICROCOMPUTER APPLICATIONS

Since 18,000 road cooperatives receive government subsidies, a computer application has been essential to carry out the yearly distribution routines. Last year a new application was programmed into a Paradox 4.0 data base. One hundred and ten pieces of information about each road must be processed, updated, and

scanned into yearly cost estimates, summaries, and administrative statistics and reports. Once a year, in April, a letter is sent to each cooperative about the subsidy for the current year and about the compensation paid the previous year. So the subsidy for each year is paid in April of the following year. Both the letter and the money are sent through electronic mail, and the post offices automatically print and seal the envelopes and vouchers.

The administrative cost of managing the cooperative road subsidies is about \$1 million, or \$55 per road.

FUTURE NEEDS

In the last few years Finland has gone through a deep economic recession that has also caused pressure on all government subsidies. Administrative culture and the share of work between state and local authorities have changed, too. Private road subsidies are less computational and more exact and detailed compared with other government supports such as child benefit and student aid.

To determine future needs, a wide-ranging group of experts was formed in 1992 with members from FinnRA, the Ministry of Transportation, the Ministry of Finance, and the Finnish Municipal Association. To reduce administrative costs and simplify the system, the group has remodeled the maintenance with statistical analysis. The report includes a proposal to change the legislation to carry out the required changes.

There are two ways to reduce the maintenance costs—combining road cooperatives to enlarge them and encouraging economic competition among maintenance organizations.