



**XXIV<sup>th</sup> World  
Road Congress  
Mexico 2011**  
Mexico City 2011.

# **GRAVEL ROAD MAINTENANCE POLICIES DEFINE THE SERVICE LEVEL OF THE UNPAVED ROAD NETWORK IN FINLAND**

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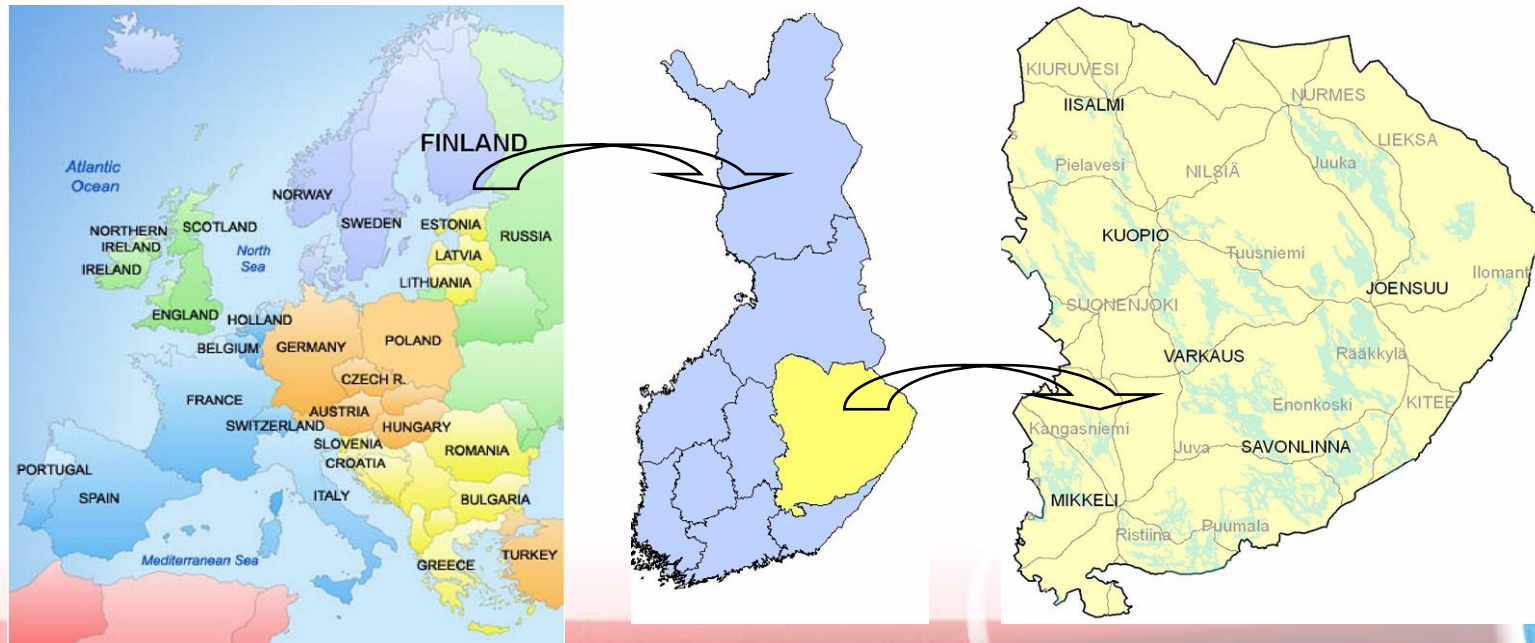


Centre for Economic Development,  
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# MAINTENANCE POLICY OF GRAVEL ROADS

- *Gravel Roads in Finland*
- *Maintenance Policy of Gravel Roads*
- *Elements of Gravel Road Condition*
- *Conclusions*

*Center for Economic of Development, Transport and Environment for North Savo*



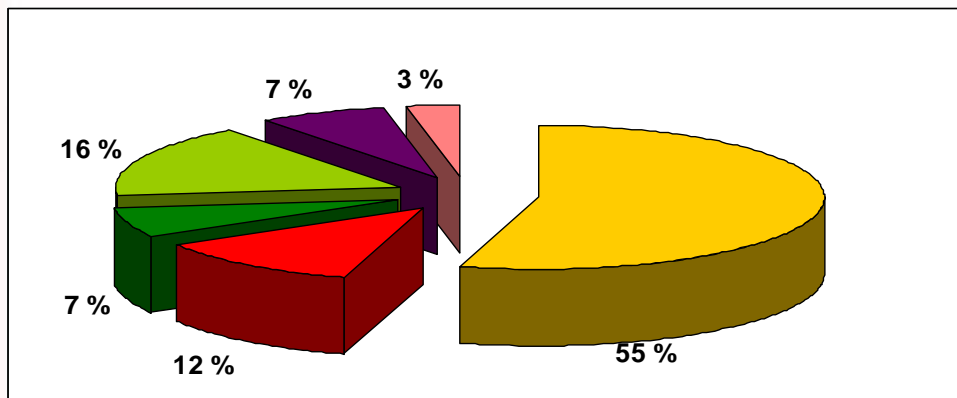
# GRAVEL ROADS IN FINLAND

- In Finland the length of the public network totals 78 000 km, of which the share of gravel roads is 28 000 km.
- Only 3 % of the traffic take place on the gravel roads
- On most part of gravel roads network ADT is 50-200
- Total expenditure for road management is 530 million euros on average per year.
- About 450 million euros for annually road maintenance, of which about 35 million euros is used for gravel roads.
- All Maintenance works are outsourcing, 82 maintenance contracts and 7 maintenance contractors.



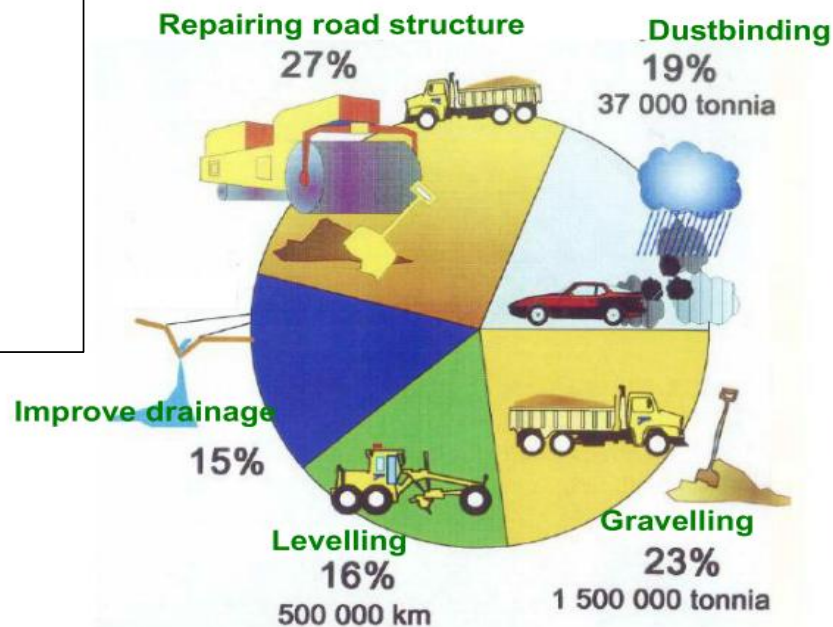
# GRAVEL ROADS IN FINLAND

*Costs in Regional Maintenance Contracts*



- Winter Maintenance
- Maintenance of traffic environment
- Maintenance of structures and facilities
- Maintenance of gravel roads
- Periodic Maintenance
- Minor Investments

*The Shares of Gravel Roads Maintenance Costs*



Asko Pöyhönen, Centre for Economic Development, Transport and the Environment for North Savo



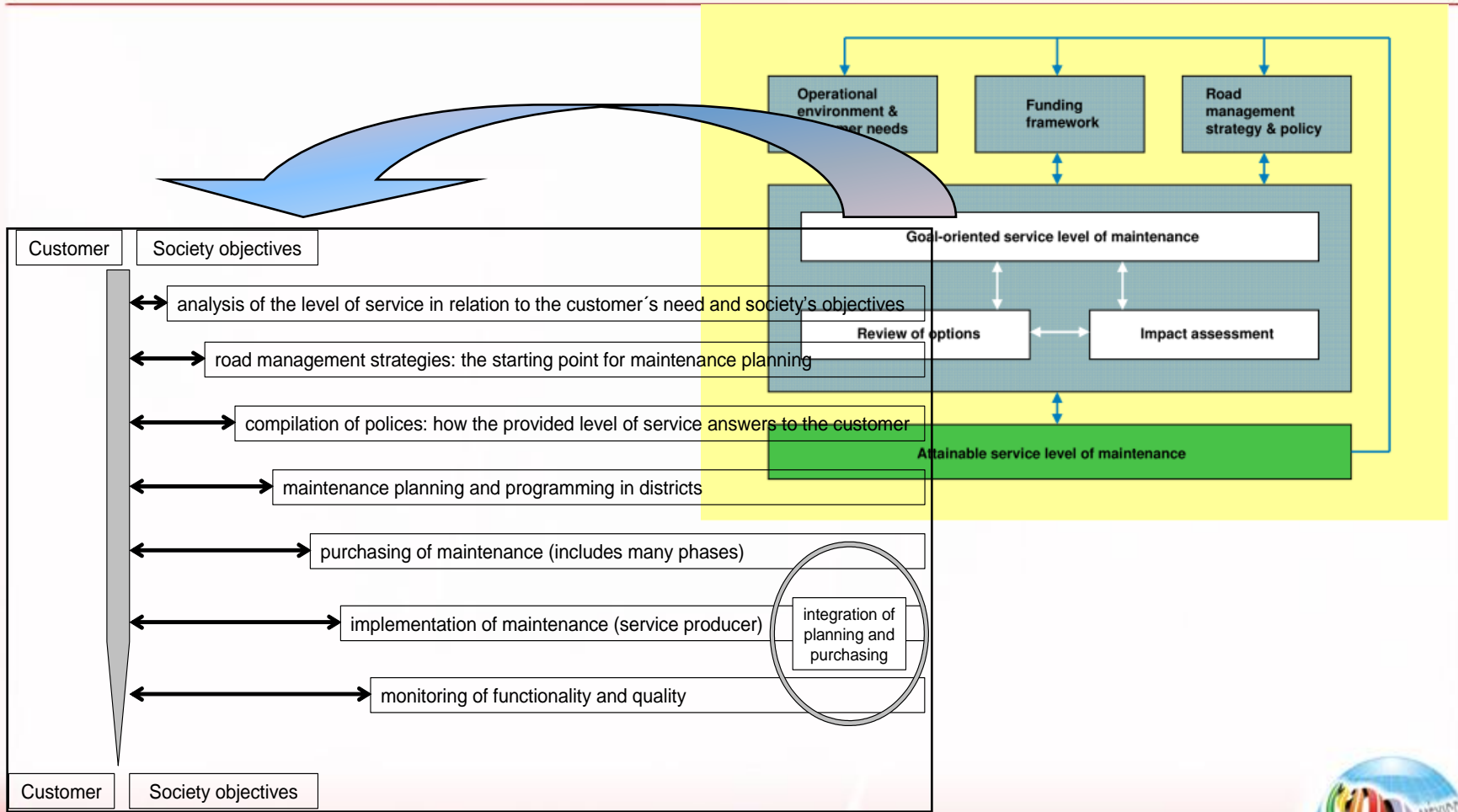
# MAINTENANCE POLICY OF GRAVEL ROADS

Some main target for gravel road maintenance policy

- Gravel roads are divided into three classes, which are used to differentiate busy and low-volume gravel road sections from the general road network
- An evenness requirement is specified for the gravel roads, which must be met except for a small section of the gravel road. Attention must be paid to the gravel road's property to give off dust under traffic.
- Daily and periodic maintenance of gravel roads must be systematic.
- Daily and periodic maintenance is implemented as cost-effectively and uniformly as possible in the regional maintenance contracts.
- Daily and periodic gravel road maintenance measures are harmonized in such a way that uniform service level is achieved on the targeted section.
- In targeting daily and periodic gravel road maintenance measures road user needs and existing road conditions are taken into account.
- Road user satisfaction and road asset preservation is improved and through interaction and communication.
- Uniform gravel road classification is followed in daily maintenance quality requirements and periodic maintenance planning in the whole of Finland



# MAINTENANCE PLANNING PROCESS



# CLASSIFICATION PRINCIPLES FOR GRAVEL ROADS

- Gravel roads (unpaved road in Finland) are divided in to three classes (I, II and III) according to spacing between junctions.
- Basic classification of gravel roads is based on average daily traffic (ADT), but it has check the summer moths traffic (June, July and August in Finland)
- When considering the classification of specific road feedback and expectations of the road maintenance received from the users are checked.
- The importance of gravel road is based on the key customer groups of the area and their needs.
- When prepering the classification it has to be ensured that
  - the division of the road network into different gravel road classes is in balance in realtion to the situation in the whole Finland,
  - role of the gravel roads in the maintenance area
  - and the position of the low-volume road network in the entire network.



# GRAVEL ROAD CLASSES IN FINLAND

Gravel Road Class	Gravel Road Network	Basic Classification	Other Criteria	
			Raising the Category	Lowering the Category
I Busy gravel roads	approx. 10%	ADT > 200		<ul style="list-style-type: none"> <li>• short section annexed to a class II road</li> </ul>
II Basic gravel roads	approx. 70%	ADT 50-200	<ul style="list-style-type: none"> <li>• road user needs taken into account</li> <li>• important role in the network</li> <li>• significant land use in the close vicinity of the road</li> <li>• part of a long connecting section</li> <li>• summer ADT &gt;250</li> </ul>	<ul style="list-style-type: none"> <li>• side road not used for long journeys</li> <li>• no land use in the vicinity of the road</li> </ul>
III Low-volume gravel roads	approx. 20%	ADT < 50	<ul style="list-style-type: none"> <li>• customer needs taken into account</li> <li>• important role in the network</li> <li>• land use in the close vicinity of the road</li> </ul>	



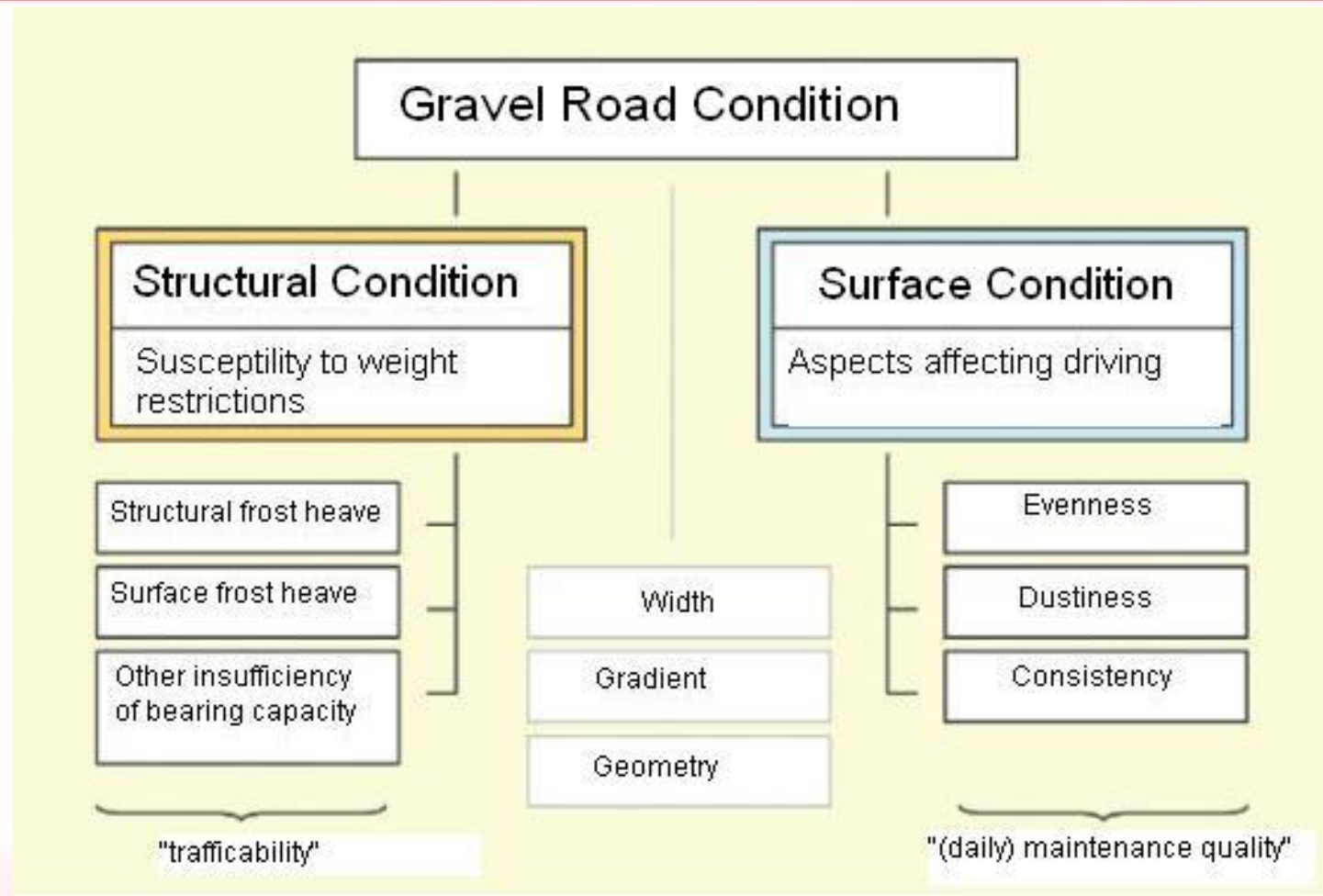


## BASIC GRAVEL ROADS (Class II)

- Spacing between junctions, which have average daily traffic 50 – 200 vehicles/day belong to this class.
- A section with lower average daily traffic volume may belong to this class
  - if it plays a clearly significant role in the area's road network,
  - or the land use of the road area sets special requirements for the road condition, for example there is heavy traffic on the spacing between junctions because of a large agricultural or cattle farm.
- Also a spacing between junctions with higher average daily traffic volume than the limit value may belong to this class,
  - if it has no significant role in the road network,
  - or it's distance is short and no special requirements has been set for its condition.
- **Most gravel roads belong to this class** in Finland (approx. 70%)



# ELEMENTS OF GRAVEL ROAD CONDITION



# ELEMENTS OF GRAVEL ROAD CONDITION

- The service level for gravel roads is defined based on different condition parameters, such as road **surface evenness, consistency and dustiness**.
  - These parameters are assessed using five-step condition classification 1...5.
  - Class 1 describes the poorest condition class and class 5 the best.
  - Each gravel road class has a so called minimum level for the condition of the road surface and structure.
- To make it easier to plan maintenance **measures and specify quality requirements**, the operational policy divides gravel road condition into two parts:
  - **surface condition** of gravel roads aims to ensure daily maintenance quality and
  - **structural condition** requirements aim to ensure the bearing capacity of roads and accessibility through all the seasons of the year.



# REQUIREMENTS FOR SURFACE CONDITION

## *Minimum levels for evenness in different gravel road classes*

Gravel Road Class	Basic Requirement for the Entire Road Network (Condition Category)	Condition Category 2 (Maximum Length)
I	3	0%

*Minimum levels for consistency in different gravel road classes*

Gravel Road Class	Basic Requirement for the Entire Road Network (Condition Category)	Condition Category 2 (Maximum Length)
II	3	
III	3	
Special requirements: <ul style="list-style-type: none"> <li>condition category 1 not accepted in any class</li> </ul>		

Gravel Road Class	Basic Requirement for the Entire Road Network (Condition Category)	Separate Land Use Sites
I	3	4
II	3	4
III	2	3

1 in any class  
 requirements in the class I within one week, in the class II within  
 n three weeks  
 : accepted

Separate land use sites (closer to the road than 100 m): <ul style="list-style-type: none"> <li>residential area on the road</li> <li>open-field cultivation of vegetables and berries</li> <li>schools, institutions etc</li> <li>other special sites</li> </ul>		
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*Minimum levels for dust in different gravel road classes*

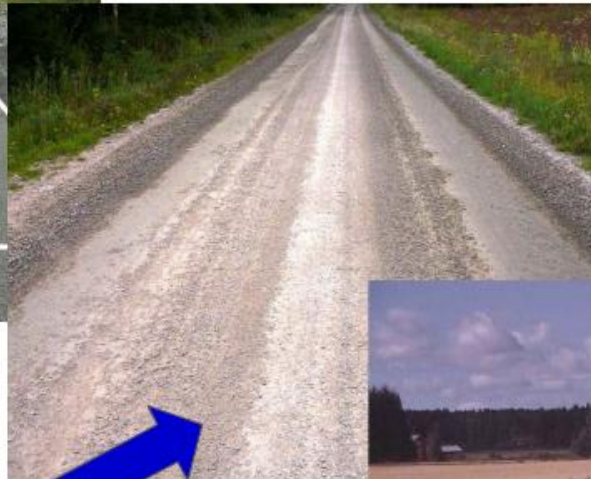


# REQUIREMENTS FOR SURFACE CONDITION

## Condition category 3



Small potholes and other unevenness can exist in some places



Loose material can exist a little bit between the vehicle path



Dust is not spreading from the road away



# REQUIREMENTS FOR STRUCTURAL CONDITION

Gravel Road Class	Requirements for Road Structure
I Busy gravel roads	No weight restrictions in principle.
II Basic gravel roads	No weight restrictions in principle on network trunk routes.
III Low-volume gravel roads	The threat of weight restrictions is removed from the most important routes for heavy transport, for example a timber transport route, or connecting route to road-side landing/terminal area. Insufficiencies in bearing capacity repeated over several years are repaired.
<p>Other rehabilitation measures:</p> <ul style="list-style-type: none"><li>• systematic drainage is used as a preventive measure, especially to reduce the softening of road structure, and consequently it lessens the threat of weight restrictions</li><li>• frost heaves causing vehicle damage, or frost heaves occurring in unexpected places in terms of the traffic safety, are not acceptable</li></ul>	

# CONCLUSIONS

- Quality requirements of the new operational policies for gravel roads were introduced in part of the regional maintenance contracts in 2009.
  - The new quality requirements were introduced into 13 regional maintenance contracts opened to tender. The total number of regional maintenance contracts is 82 in Finland.
  - The contractors raised the issue of how difficult it is to meet the quality requirements in regard to evenness and dustiness for example.
  - However, no clear increase in the costs was seen in the tenders for gravel road maintenance.
- The summer 2010 was hotter than usual in Finland.
  - The problems of dustiness and evenness have been recognized in the implementation of maintenance contracts.
  - Customer satisfaction remained at the same level as in the previous years and greatest dissatisfaction was caused by gravel road condition during the spring thaw season.
  - In the summer gravel road unevenness and dustiness were experienced as problems.



# MAINTENANCE POLICY OF GRAVEL ROADS



*Thank you for your attention !*

