

NordFoU Project – Pavement Performance Models

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NordFoU Cooperation program

- NordFoU is a cooperation program established by the road authorities of the Nordic countries to coordinate their research and development effort
- NordFoU was formally established in December 2004
- Several R & D projects were initiated under the cooperation program
- One of the projects deals with development of performance prediction models for flexible pavements



The problem



Lack of timely maintenance/ preservation

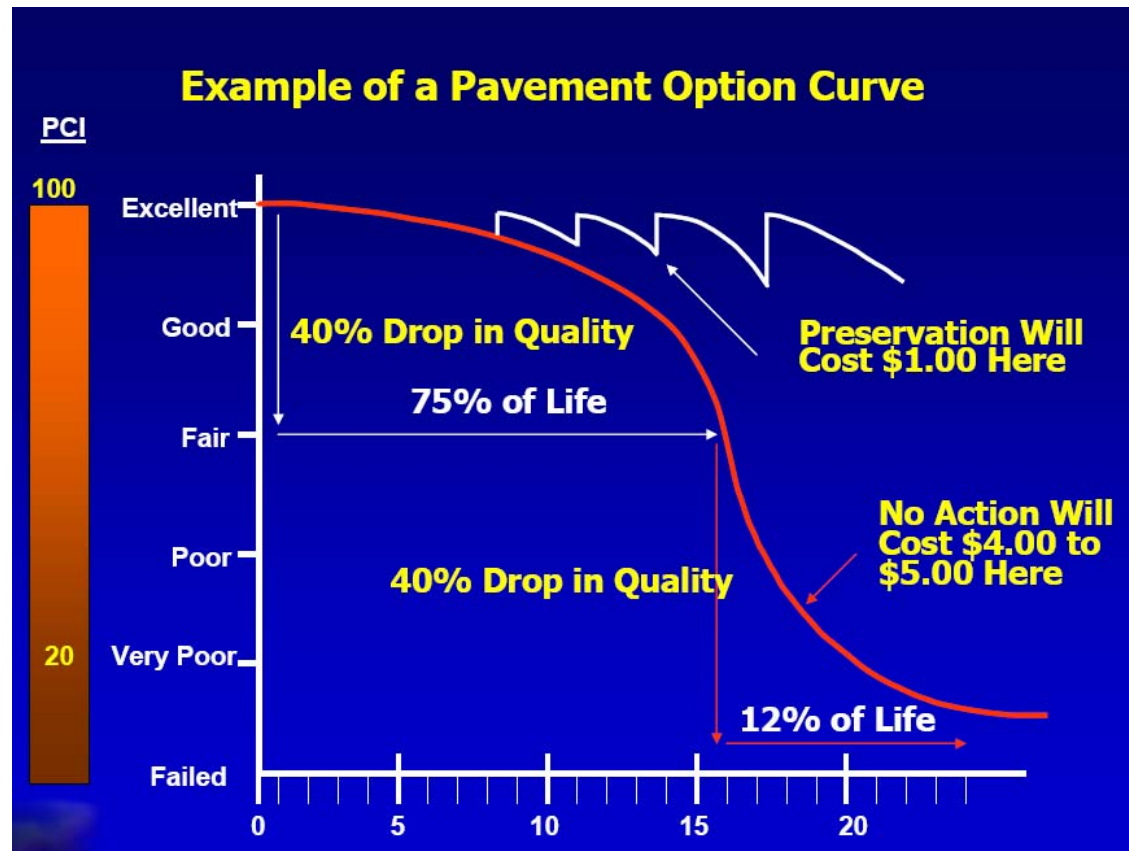


To preserve the road infrastructure asset

- How does the condition of the road network changes over time?
- What will be the consequence if we change the budget?
- What should be the correct level of investment to maintain the road asset?
- When does a road needs maintenance/ rehabilitation?
- What is the optimum solution for each project when the budget is limited?
- What is the effect of the choice of material/thickness on service life ?(condition x years from now?)



The right time and the right treatment



Performance prediction

- Performance/condition prediction is an important element in decision making tools:
 - PMS
 - Asset management systems
 - Design systems
- However it also represents the weakest link in these decision support systems

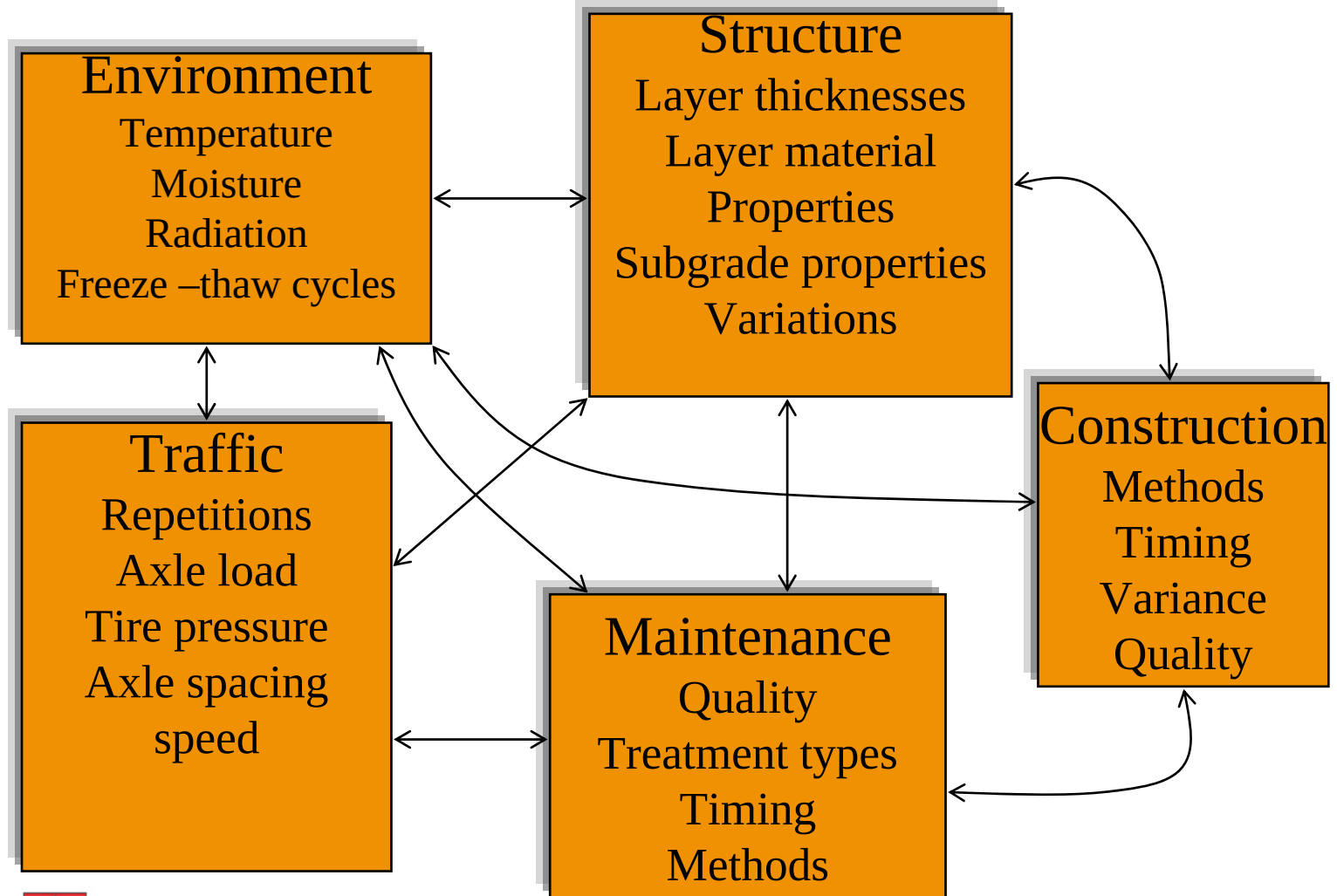


Available prediction models

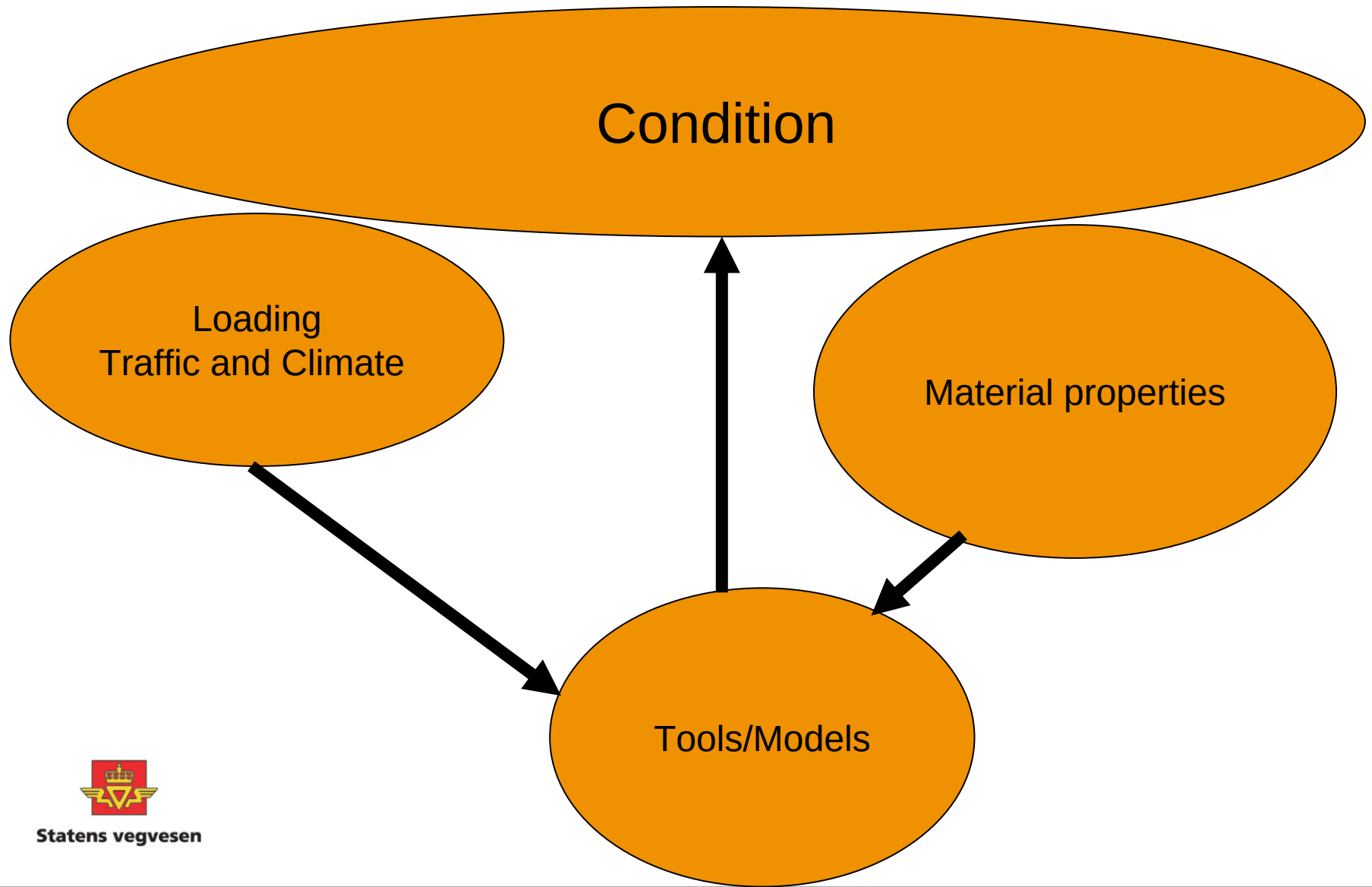
- Are not comprehensive enough – simplifications, not all defect types, not all influencing factors, interaction b/n the various defects
- Accuracy? Not possible to make accurate and precise prediction of pavement life.
- Mostly empirical relationships that can not be applied to other conditions
- Mostly deterministic
- Limitations with regard to:
 - Climatic effects
 - Studded tire effect



Several factors affect performance



Performance/condition prediction



Current situation in Nordic countries

- Mainly simple extrapolation of historic condition data is used for maintenance planning in PMS.
- Difficulty in predicting pavement condition over longer time period (pavement life)
- Some more advanced models in design systems (Sweden and Denmark)
- Relatively large amount of condition data is collected every year in most Nordic countries



The NordFoU Project – Pavement Performance models

- The project is led by Norway
- Denmark, Island and Sweden participate
- The project being conducted in two stages:
 - Stage 1: Preparatory stage (2006)- completed
 - Definition of goals and objectives
 - Preparation of Project plan
 - State-of-the-art report
 - Stage 2: Main project (2007 – 2009) - started



Goals of the NordFoU project

1. Adopt existing performance/condition prediction models to Nordic conditions and implement improved models in each country
2. Utilize data from test sections, reference sections, and special equipment in the various countries to evaluate and improve models
3. Increase competence in the modeling/ calculation of deterioration/condition of road structure in each Nordic country
4. To disseminate results, information and knowledge in the area of road condition prediction in each Nordic country.



The project aims to:

- Develop a practical model/tool which takes into consideration:
 - Climate effects
 - Traffic
 - Material properties

And which can predict condition with regard to:

- Rutting
- Roughness
- Cracking etc

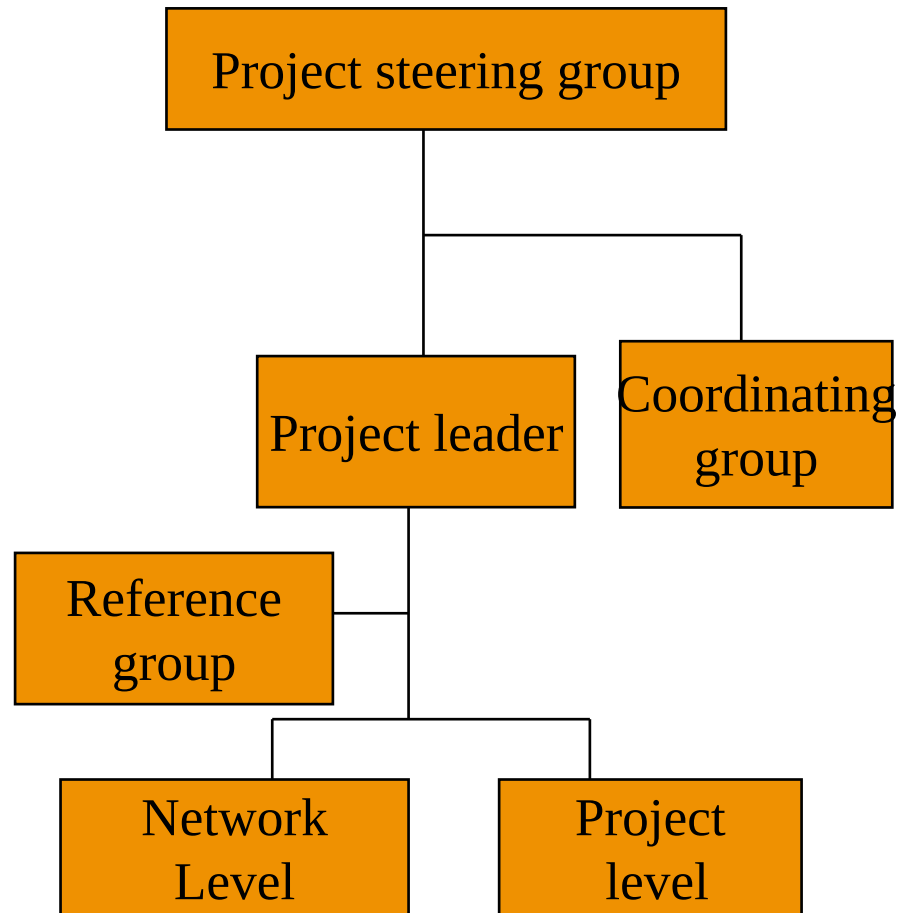
And which can be used to evaluate the effect of various maintenance efforts.



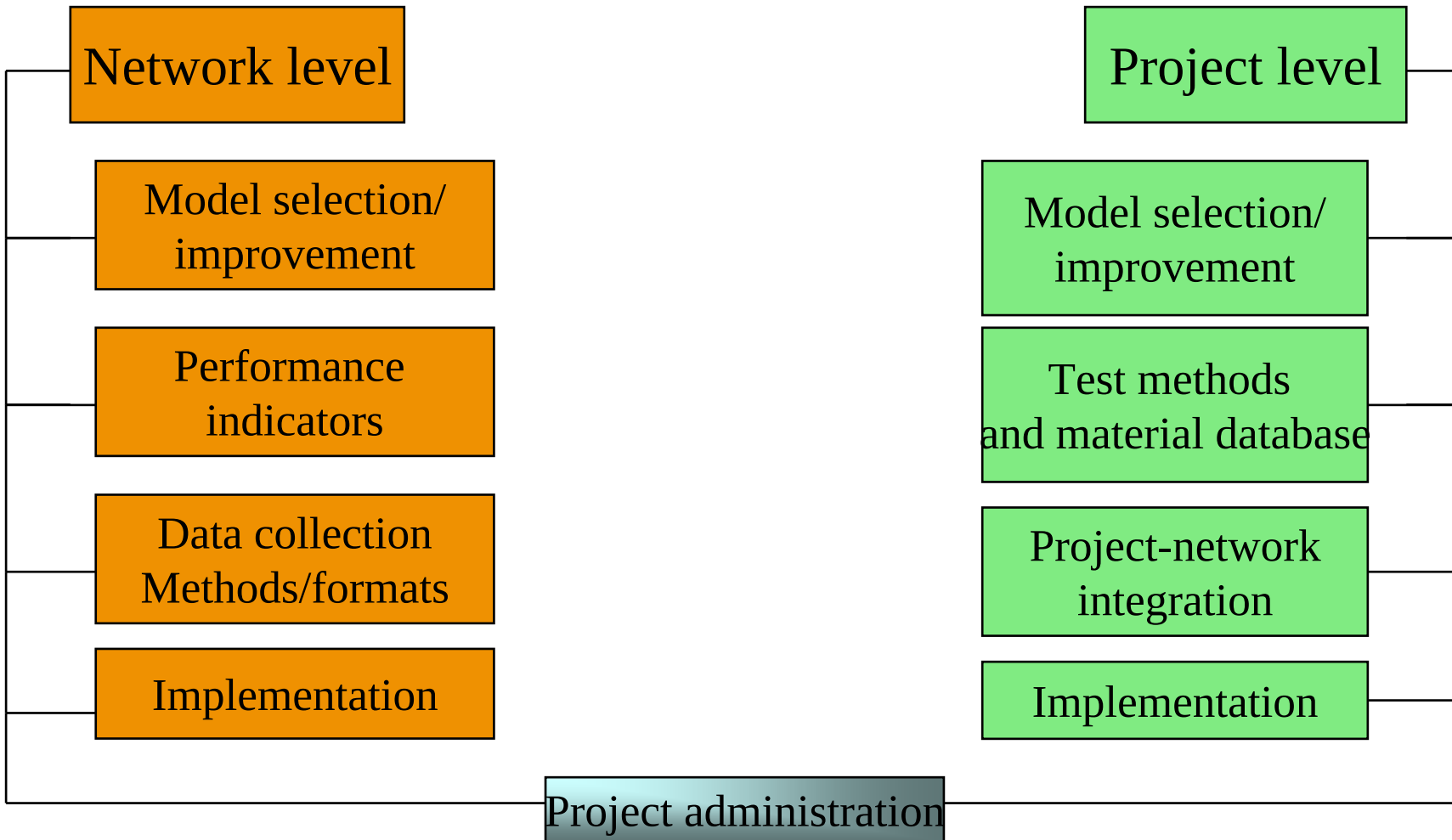
Project organization

The project is divided into to parts:

- Project-level models
- Network-level models
- Several work packages in each part



Work packages



Cooperation

- We work with NVF 34
- Several Nordic countries have cooperation agreement with MnRoad
- We would like to have as much cooperation and information exchange as possible with researchers in other countries

