

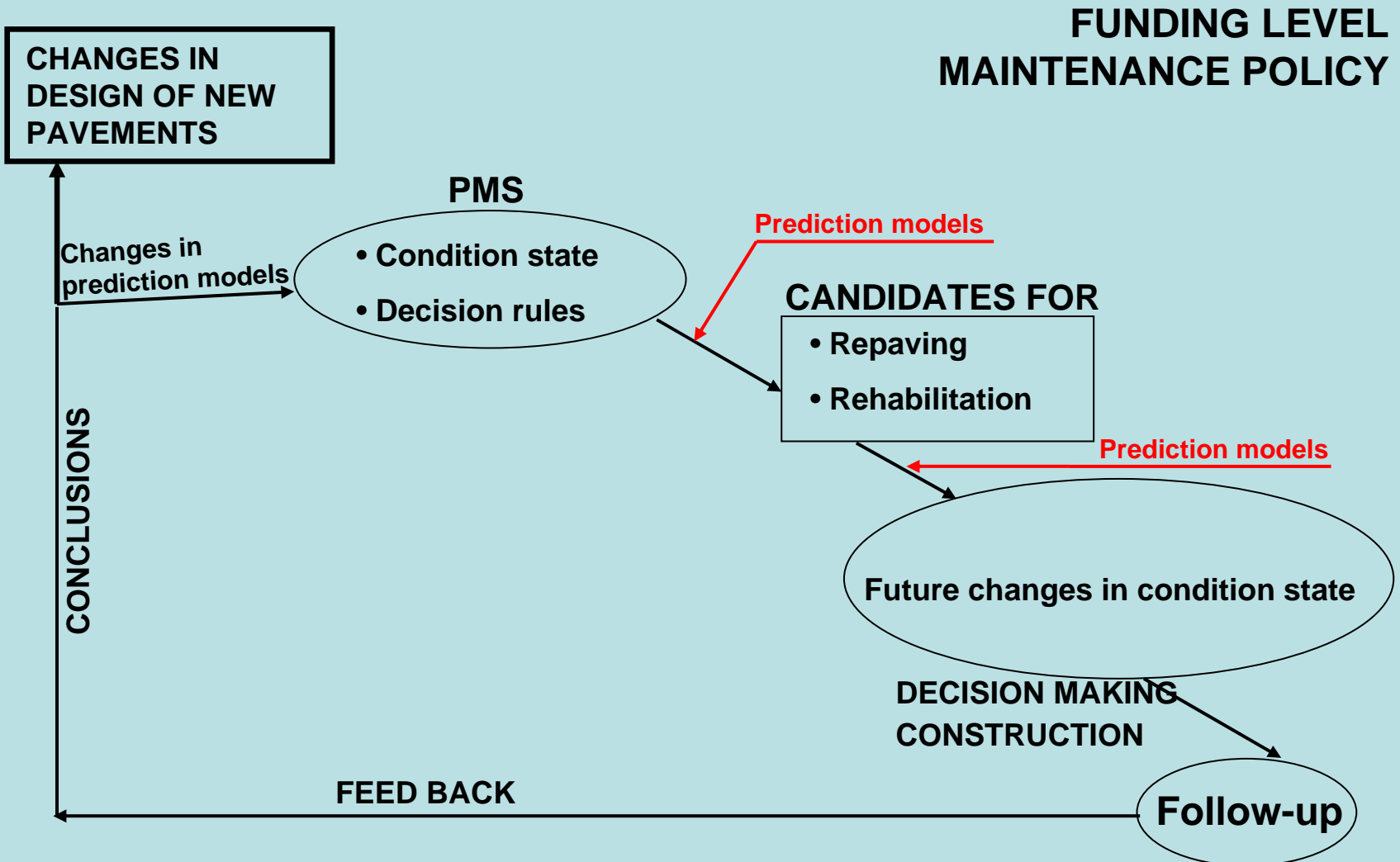
# Pavement performance prediction models in Finland

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# THE MAINTENANCE PROCEDURE



# The need for models

- Network level (PMS)
  - Predicting roads needing rehabilitation
  - Prioritizing
  - The change in condition state distribution
- Project level
  - The right time for rehabilitation
  - The condition after rehabilitation
  - The condition state  $x$  years after rehabilitation

# Background for models

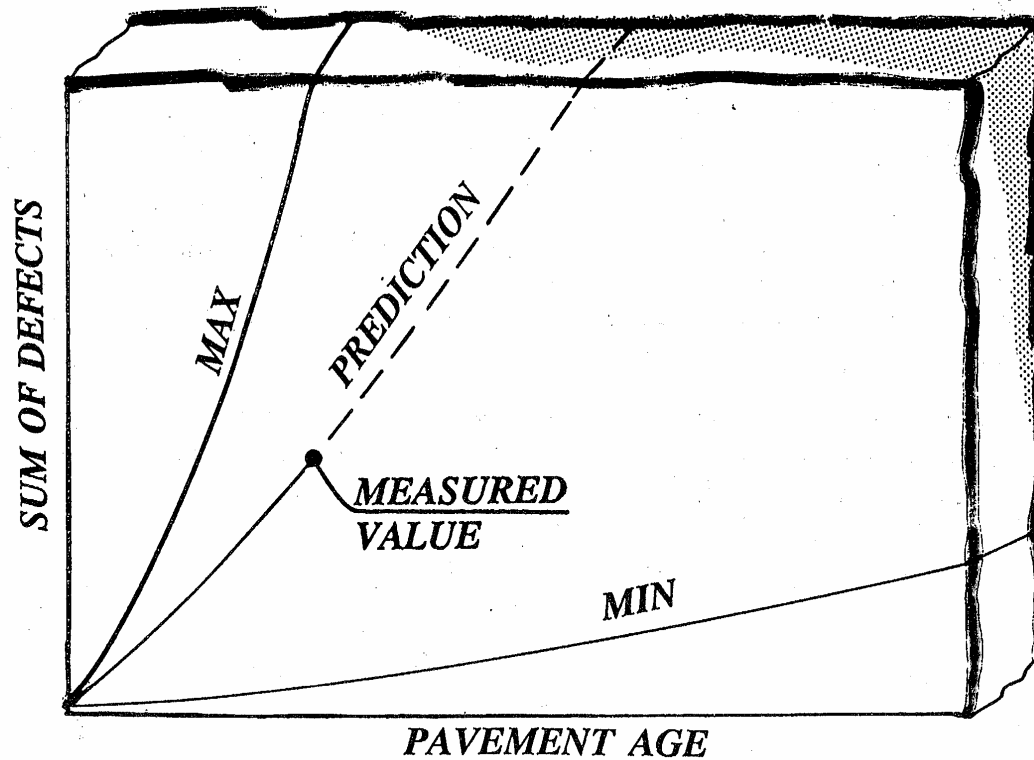
- PMS in use since 1988
- The essential condition state indicator is sum of defects
- Other indicators are rut depth and evenness (IRI)
- The condition data has been collected since 1988
- First deterioration models were based on data collected from test section network in 1980's, latest check of models was carried out two yeras ago

# Principle of predicting the change in the sum of defects (Road Condition Measurements and Pavement design in Finland, 1993)

SUM OF DEFECTS = RATE \* TIME<sup>N</sup>

RATE = (MEASURED VALUE)/(PAVEMENT AGE)<sup>N</sup>

N = VARIABLE, DEFAULT VALUE FOR ASPHALT CONCRETE IS 1.6



# The condition data

- Lots of data available for almost 20 years
- Lack of accuracy in the data, especially the data of defects
- Registration of rehabilitation actions is on general level
- The collecting of distress data is automated 2006

## Need for improvements in prediction models

- How to find the most cost effective actions
- How to avoid the least cost effective actions
- What is the combined effect of different actions: widening of the road, improvement of the drainage, strengthening of the road structure etc.

## An example of the problems in practice, 1



Kuva 3. Päällyste on murtunut tien reunasta.



## An example of the problems in practice, 2

Lots of heavy vehicles  
The slopes are steep  
The materials are of poor quality



## An example of the problems in practice, 3





## An example of the problems in practice, 4



## An example of the problems in practice, 5: how much does the new culvert improve the condition state?



Kuva 2 . Pl 2510 ympäristö: Sivutierumpu routunut ja noussut, vesi ei pääse päätierummulle + lisäksi päätierumpu on tukossa. Tiessä näkyvissä kohteelle tyypillinen vanha, reikiintynyt päällyste.