

Project Proposal:

Validation of Performance Models

Table of content

[Background for the project 3](#_Toc293568607)

[Objectives and results 3](#_Toc293568608)

[Benefits of the project 3](#_Toc293568609)

[Project activities 4](#_Toc293568610)

[Time schedule 4](#_Toc293568611)

[Organisation 4](#_Toc293568612)

[Resources and Economy 5](#_Toc293568613)

[Appendix 1: Time schedule 6](#_Toc293568614)

[Appendix 2: Detailed budget plan 7](#_Toc293568615)

# Background for the project

This project proposal suggests a continuation of the NordFoU project on Pavement Performance Models that ended in 2010.

The NordFoU Pavement Performance Models project dealt with development of performance (or deterioration) prediction models for flexible pavements. The project was divided in two parts:

* Part 1 – network level models - lead by the Danish Road Institute (DRI), and
* Part 2 – project level models - lead by the Swedish Road Administration.

The outcome of part 1, network level models, was computer software for predicting future conditions of flexible pavements, as well as recommendations on data collection for input to the Nordic Pavement Performance Models. The software is a re-programming in MATLAB of the HDM4-deterioration models. Following re-programming, the MATLAB program was calibrated for Nordic conditions, based on historical sets of data from 5 road sections in Southern Sweden.

This project proposal suggests to validate the model further, by including data from the remaining geographic regions represented by the countries participating in the NordFoU Pavement Performance Models project; Denmark, Iceland Norway and Sweden.

# Objectives and results

The main objectives of the project are as follows:

1. Identify 3-6 test sections in each of the countries; Denmark, Iceland, Norway and Sweden. Initiate collection of data on construction, traffic and condition surveys.
2. Improve current MATLAB program by making it more robust to different climatic zones and construction traditions in Nordic countries. To do this, data from test sections will be utilized to validate and possibly calibrate further the deterioration models in the MATLAB program. Included in this is a quality check of existing program.
3. Stimulate the development of expertise and related activities in the area of performance modelling (prediction of condition) of road structures in each Nordic country.

The deliverables of the project are:

* Report describing the findings of the project.
* Validated and improved MATLAB program.
* User’s Manual.
* Database with data from test sections, including description of data.

# Benefits of the project

The overall benefits of the NordFoU Pavement Performance Models project still apply as benefits for this continuation of the project:

1. Better possibility for calculation of future road maintenance and operation costs.
2. Optimum use of resources, which may lead to reduced road maintenance and operation costs.
3. More effective road asset management.
4. Better possibility to evaluate effects of different maintenance strategies and measures.

# Project activities

The project will be divided into four work packages.

##### WP1: Data collection and database

Activities in this work package include

* Specifying requirements for test sections
* Develop instruction and data sheet for data collection
* Data collection in Nordic countries (each participating country delivers historic data from relevant sections)
* Assembly of database including description of data

Deliverable: Data base including description of data.

##### WP2: Validation and calibration of MATLAB program

Activities in this work package include

* First stage of improving MATLAB program (Quality check, user interface)
* Test run on new data (from WP1)
* Determination of sets of calibration factors depending on e.g. climate, traffic, etc.
* Validation of MATLAB program
* Writing “User’s Manual”

Deliverable: Validated MATLAB program and User’s Manual.

##### WP3: Reporting

Activities in this work package include

* Writing of report that documents the work performed, the sets of calibration factors found, resulting comparison between measured and predicted performance as well as recommendations for implementation.

Deliverable: Report “Validation of Network Level Models”

##### Note on Dissemination

Dissemination activities are still on-going in the NordFoU Pavement Performance Models project. Dissemination of results from this continuation of the project will be part of the overall dissemination. For this reason no resources are allocated to this activity in this project proposal.

# Time schedule

The project starts 1st of February 2012 and ends 1st December 2012.

A detailed time schedule is shown in Appendix 1.

# Organisation

The project organisation continues as it was set up for the NordFoU Pavement Performance Models project:

|  |  |
| --- | --- |
| Project Steering Group: | Takes the overall financial and technical decisions. For this continuation of the project, the major role will be to evaluate the quality of the final outcome. All participating countries are represented (Denmark, Iceland, Norway and Sweden) |
| Project leader: | Denmark has the responsibility as daily leader and coordinator of the NordFoU Validation of Performance Models project.  Susanne Baltzer, Danish Road Directorate (DRD), is appointed project leader. |
| Project group: | The technical work will be organised and co-ordinated by Susanne Baltzer, DRD. The work will be conducted by DRD and COWI A/S. |

# Resources and Economy

The budget for the project group is 75.000 Euro. All 75.000 Euro will be spent in 2012.

The budget excludes the contributions from:

* Project Steering Group
* Project Leader
* Data collection in each country (each participating country delivers historic data from relevant sections)
* Dissemination

These costs are assumed covered by the participating road authorities.

A detailed budget plan is shown in Appendix 2.

## Appendix 1: Time schedule



## Appendix 2: Detailed budget plan

|  |  |  |
| --- | --- | --- |
| ACTIVITIES | **Hours** | **Cost in Euro** |
| **DATA COLLECTION AND DATABASE** |  |  |
| Specify requirements for test sections | 20 | 1,920 |
| Develop instruction and data sheet for data collection | 80 | 7,373 |
| Data collection in Nordic countries | 0 | 0 |
| Assembly of database including description of data | 15 | 1,629 |
| **WP1 Total** | 115 | 10,922 |
| **VALIDATION AND CALIBRATION OF PROGRAM** |  |  |
| First stage of improving MATLAB program | 135 | 13,673 |
| Test run on new data | 160 | 15,013 |
| Adjustment of calibration factors | 160 | 15,013 |
| Validation of MATLAB program | 40 | 3,512 |
| User's Manual | 40 | 3,686 |
| **WP2 Total** | 535 | 50,898 |
| **REPORTING** |  |  |
| Description of data collection | 20 | 2,172 |
| Description of calibration process and factors | 20 | 1,997 |
| Results: measured/predicted conditions | 60 | 5,992 |
| Recommendations for implementation | 15 | 1,619 |
| Future works. | 10 | 999 |
| **WP3 Total** | 125 | 12,778 |
| **PROJECT TOTAL** | **775** | **74,598** |