

# **MAINTENANCE CONTRACTS EXCHANGE OF DATA BETWEEN CONTRACTOR AND CLIENT**

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## **ABSTRACT**

Since 2003 all maintenance work on national and county roads has been tendered out on contract. Altogether there are 110 contracts covering 54,000 km of road, which means that an average contract covers about 500 km.

There are a lot of requirements contractors have to comply with, and a lot to follow up for both parties. We realised at an early stage that using paper in this process would cause us trouble in the long run. We started a preliminary project in the autumn of 2005 to look into different web solutions. It was used for the first contracts in September 2007. Our contracts last for five years, so our system will be fully implemented for all maintenance contracts by September 2011.

Eventually, the system is intended to encompass all written material exchanged between the contractor and the client. However, we are not at that stage yet. Each year we increase the number of contractual requirements to be included. Contractual requirements also change, so it is necessary to make yearly adjustments.

## **KEYWORDS**

MAINTENANCE, CONTRACTS, CLIENT, CONTRACTOR, COMPUTERISED SYSTEM, MODULES

## **1. INTRODUCTION**

Since 2003, all maintenance work on national and county roads has been tendered out on contract. Altogether there are 110 contracts covering 54,000 km of road, which means that an average contract covers about 500 km. The contracts cover all maintenance activities, and are performance-based. Replacement costs for the roads in question amount to about NOK 420 billion. NOK (€46 billion as at 29 June 2009).

In-house production ceased in 2003, and the Production Division of the Norwegian Public Roads Administration (NPRA) was established as a separate state-owned company which had to bid for jobs like any other contractor.

## **2. DEVELOPMENT OF COMPUTERISED SYSTEM**

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contracts last for five years, so our system will be fully implemented for all maintenance contracts by September 2011.

Eventually the system is intended to take care of all written material exchanged between the contractor and the client. However, we are not at that stage yet. Each year we increase the number of contractual requirements to be included. Contractual requirements also change, so it is necessary to make yearly adjustments. The purpose of the system is:

- To establish a good way of managing contracts
- To ensure correct reporting from contractors
- To save time for both parties
- To have greater consistency in data for statistics (such as quantities of sand and NaCl)

It is important for stakeholders to participate in all phases of the project. We have therefore had client representatives from all five regions, and representatives from the contractors. This is crucial when we are in the process of implementation. The potential users have taken part in the development, and serve as “missionaries” in implementing the system. The two sides may have different views of the usefulness of different aspects of the data that are collected and transferred. So far the project group has had 40 meetings. In the first phase we met every two months. Now we meet four times per year.

All parties must feel that it is to their advantage to use the system. Many data are used several times. Therefore it is important with a seamless interface to avoid the same data being typed several times.

So far some 50 activities and 40 administrative requirements are included in the system. It has been welcomed by both client and contractor as a simplification of an otherwise elaborate manual system.

We call our system ELRAPP, which stands for electronic reporting between contractor and client. For the client, the system is available on his intranet, while the contractor has access through the internet.

It consists of four different modules:

- Client module
- Contractor module
- Module for technical inspection
- Module for overview of personnel

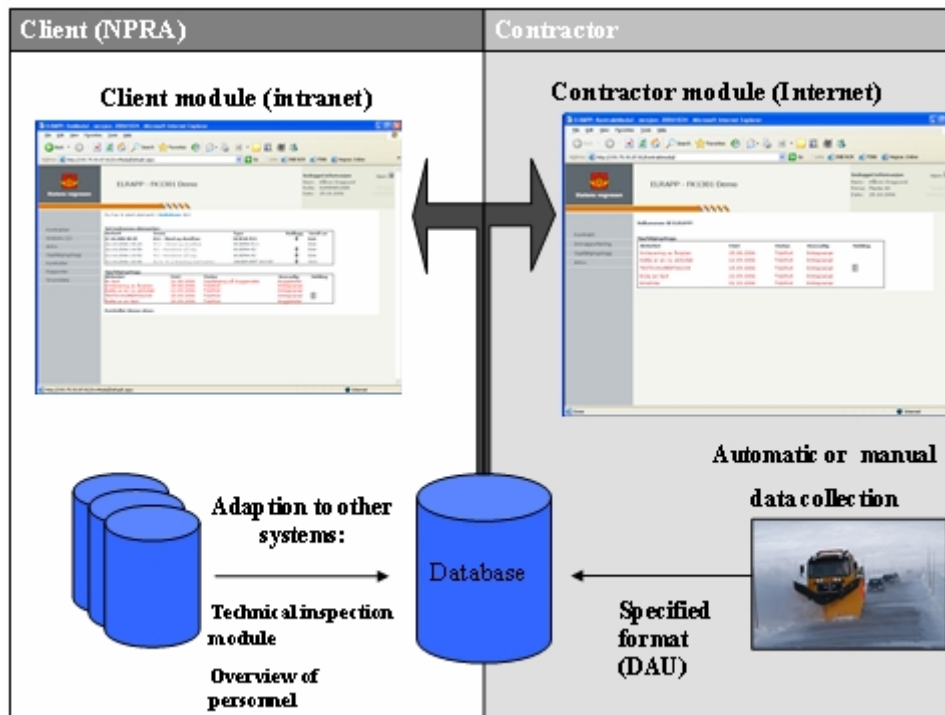


Figure 1 – Schematic overview of data flow

## 2.1 CLIENT MODULE

This module is intended for personnel from NPRA, both for receiving reports from the contractor and for following up own activities related to each contract. All reports from the contractor will be received here. If deadlines are not met, the client will automatically receive a message.

Here client can also plan his programme for making spot checks of work done by the contractor. This programme is not available to the contractor. However, he will be invited to take part in such checking to make sure that both parties are in line in their understanding of the meaning of the different requirements.

The client installs the relevant information for each contract in this module at the start of each contract. Requirements intended for the contractor will be transferred to his module. Some requirements have definite reporting dates, others when things occur. So the contractor sends his messages accordingly.

Norway is a winter country. In many districts winter costs represent more than half of total maintenance cost. Special emphasis is therefore made on following up winter activities. Some contracts have fixed prices, and for some contracts settlement is based on work done and quantities used for such items as salt and sand. In both cases we want information about quantities, and the times when measurements were taken. Salt is required to be measured for environmental reasons.

The client's task at the start of each contract is:

- To register each contract with specific data for that contract
- To load in the road network for each contract
- To list activities (may vary from one contract to another)
- To list other formal requirements
- To administer access

This module is accessible on NPRA's intranet.

## **2.2 CONTRACTOR MODULE**

As mentioned above, the contractor has access via the internet, and only to his own contract. Basic data for the contract are provided by the client.

Since the contracts are performance-based, it is also the contractor's job to monitor developments on the road, and take appropriate action when things occur. The client only makes spot checks. However the contractor is required to report such things as incidents, accidents which damage road objects, quantities, especially related to winter. In case of severe conditions, he is required to report at once if he will not be able to fulfil the requirements of the contract.

Some requirements have to be met on definite dates, and some when relevant. If the requirements are not reported by the specified dates, the colour of the requirement will turn from black to red. The client will automatically be notified. When the contractor reports, the client can make comments on the messages sent by the contractor, and things may be accepted or may need further attention.

If requirements are not met, the contractor will be penalised. However, if there are conditions beyond the contractor's control, he may avoid this. An example may be extreme weather conditions. However, this will only apply if the contractor gives notice as soon as such conditions occur. If he does fails to do so, he will still be penalised.

He may also be penalized for discrepancies found in his administration or organisation of the work or in conditions on the road. The standard deduction is NOK10,000 (€1,104 as at 29 June 2009) for documented discrepancies. Deductions of up to NOK 200,000 (€22,073) may be made for serious discrepancies. It is also an option for the client to order the work to be completed by another contractor and invoice the contractor. If there are repeated problems, the contract can be terminated.

The contractor is required to report quantities of things such as sand and NaCl used for gritting, and distance for snow ploughing. This can be done in two ways, either manually by filling out forms, or by automatic data collection. The contract specifies which of these two methods shall be used. The following data shall be reported as a minimum:

- Car/truck or machine no.
- GPS position
- Start and stop of activity
- Distance (km)
- Speed (km/hr)
- Distance with spreader

- Spreading width
- Consumption of sand or NaCl
- Type of material
- Spreader on/off
- Plough on/off

It is up to the contractor to provide equipment for automatic data collection. There are several standard systems available on the market. NPRA has specified an interface the contractors have to adapt to. However, we are struggling to achieve sufficient accuracy with automatic data collection. We are working together with our colleagues in Sweden and Denmark to try to achieve sufficient accuracy.

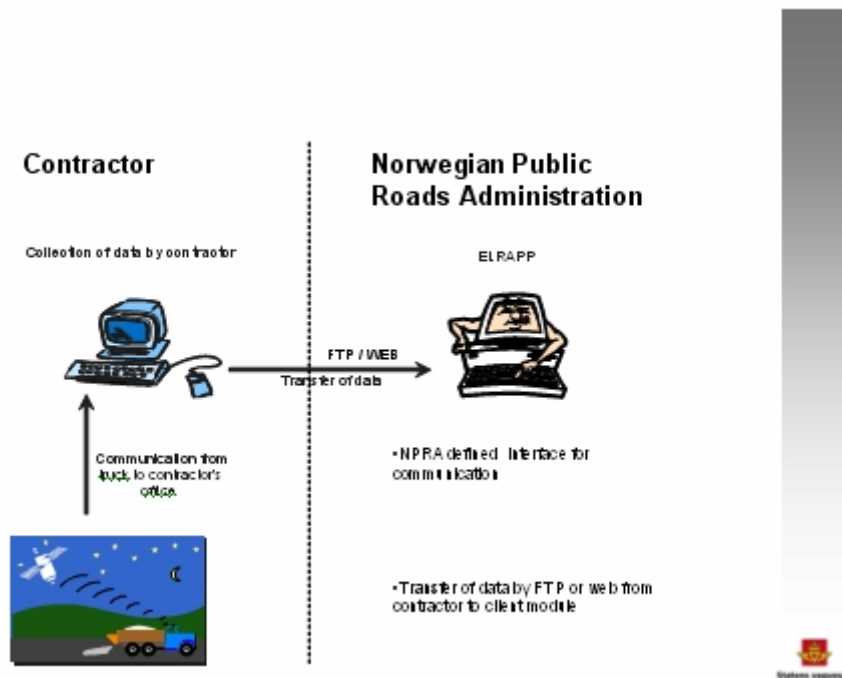


Figure 2 – System for automatic data collection

### 2.3 MODULE FOR TECHNICAL INSPECTION

The client takes spot checks according to a predetermined plan of the condition of the road to check the quality of the contractor's activities. This planning process is done in the client module, and transferred to this module prior to the inspection trip. The plan covers person responsible, which stretches of road to inspect, and which activities. It is planned according to effects on traffic safety, and such that the whole road network is included over time. The daily supervision is the responsibility of the contractor.

The basis for this inspection is that it can be done while driving the car at a low speed. We therefore recommend that only two to five activities be checked at a time, depending on the traffic level on the road in question. The inspection schedule is loaded onto a PC, and this PC is used to register defects. If required, both photos and technical reports can be attached to an entry regarding a defect. Since this causes discussion with the contractor, it is important to have good documentation to avoid lengthy discussions. This is typically an item for the monthly meeting.

This module is used both for collection of data from inspections and for messages to and from the contractor. After an inspection, data are transmitted to the client module for use at contract meetings and for statistical purposes. NPRA is also required to report defects to the Ministry of Transportation and Communications.

## **2.4 MODULE FOR OVERVIEW OF PERSONNEL**

The last module is a requirement from the Government to report all personnel working on each contract each day. It is not connected directly to the other modules, and is available on the internet to both NPRA representatives and contractors. It can be used with all types of contracts, not just maintenance contracts. The purpose of this module is to prevent tax evasion.

## **3 TRAINING FOR USERS**

NPRA provides training for both in-house personnel and contractors each year. Both client and contractor personnel are required to attend a course which involves both theoretical and practical training.

A comprehensive user's manual has been made with a detailed description of how to use the training module. Each of the five regions also has one specialist to give extra instruction. .

We emphasize the value of input from the users, and try to improve user friendliness. The system has been welcomed by users on both the client side and the contractor side as a means of handling contracts more efficiently.