PRODATA – A COMPUTERIZED MANAGEMENT SYSTEM FOR ROAD MAINTENANCE

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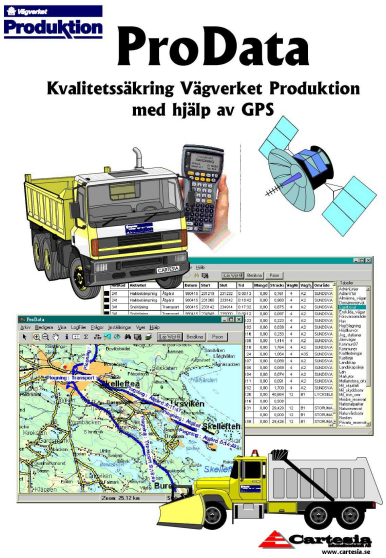
Background

The so-called Computerised Society has indeed not been as paper-less as predicted, at least not within road construction and road maintenance. There is a great demand to decrease the amount of costly documentation and of the paper-flow, i.e. different follow-ups, invoicing, payment to suppliers and subcontractors not to mention all the documentation within the quality assurance. Therefore "Vägverket Produktion", a profit centre for road construction and road maintenance within the Swedish National Road Administration, SNRA, has developed a computerised management system for the working activities within the sector, the so-called ProData.



Aim

The main purposes of ProData is to be able to

- make road inspections and register faults for later measurements,
- register what has been done,
- make different kinds of inventories.

Implementation

The idea is that every vehicle/driver has access to a hand terminal and a GPS receiver (Global Positioning System).

All conceivable road maintenance activities are pre-programmed in the hand terminals, which are mounted in the vehicles and connected to the GPS. In order to simplify the handling of the handterminals, all activities are organised in different lists. Each list refers to a field of operations (winter road maintenance for instance) and contains all the activities that belong to that particular field.

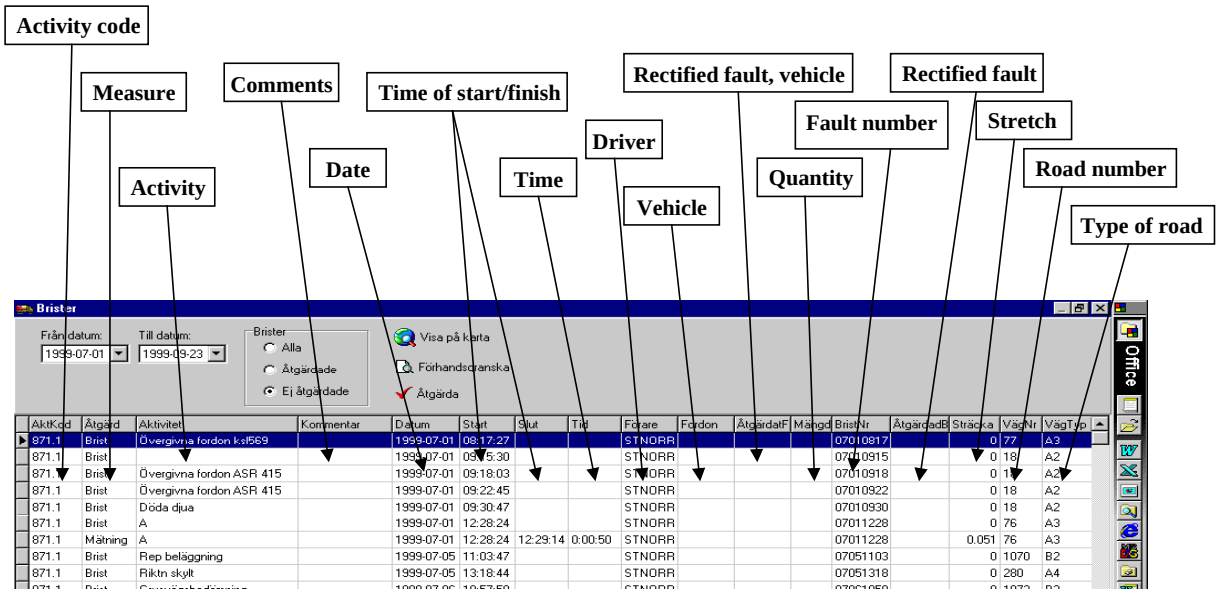
How to handle ProData

To register an activity the driver/operator is to,
- identify himself
- identify the vehicle
- choose the activity
- press the button ”start” when the activity starts (e.g. snow ploughing)
- press the button ”stop” when the stretch is ready
- press the button ”transport” when hauling from one place to another.

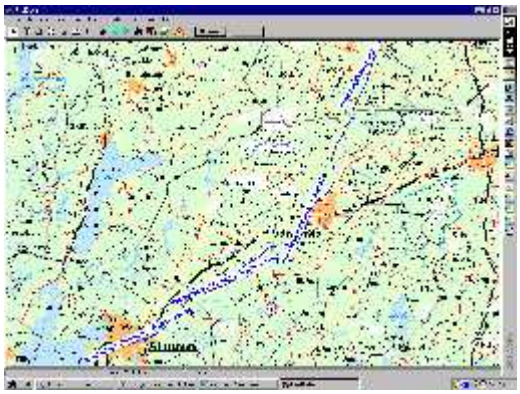
When ProData is used for road inspections the program offers different search options, e.g. registered faults listed from the inspection, faults already rectified or faults that still require action.

Every registered fault is automatically assigned a unique number together with the registration date and the exact time of the day. This is used to verify when the fault was discovered for quality assurance purposes.

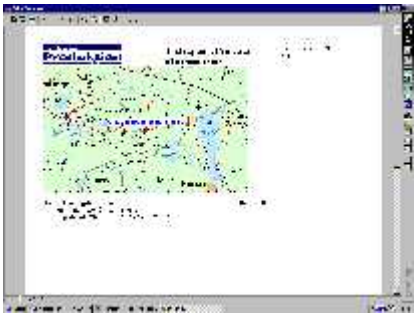
All rectified faults are registered with the date and by the time of the day when the activity took place. This is also important for quality assurance purposes to verify that the fault was rectified within the right time period. The hand terminal can be used up to 80 hours before the data must be transferred to the PC due to the memory capacity. The system can deliver various types of lists and maps.



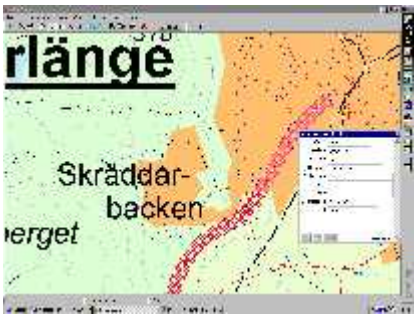
This is an example of a registration list. There is a possibility to make comments on an activity that has been carried or on a registered fault. The quantity can be filled in, e.g. the quantity of salt that has been spread on a certain stretch.



The example above show a working activity consisting of both snow ploughing and de-icing using salt solution. The map shows the date, the time and the different stretches were the activity took place.



The list of faults can be used to set up a work schedule with a map indicating the exact location of a fault along with an explanatory text on what is to be done. In this actual case gravel road grading should be done.



Since the accuracy of free GPS-signals, on the instruments chosen, is +/- 50 m, a buffer zone of 240 m has been created around each road. In this way the GPS-signals can recognise which road it is.

Conclusions

The system is ready to use for the following applications,

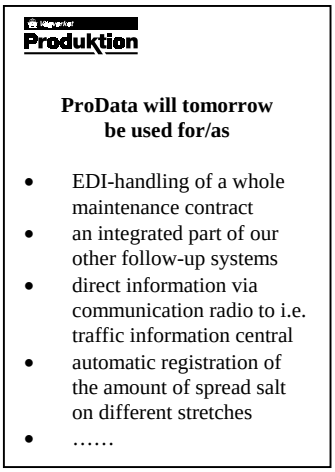
Produktion

ProData is today used for/as

- quality assurance
- basis for invoicing
- basis for payment to subcontractors
- basis for future calculation and planning of different activities

Each equipment, hand terminal + GPS-receiver, costs about 1200$. The payback time, when ProData is used, for the applications that his picture shows is about one year.

We can see a lot of applications for which we can use the system in the future. We have an on going development for the following applications,



These new applications will shorten our payback time even more.

In Sweden all the road constructions and all the road maintenance and operations on the State roads are bought in competition from either the internal profit centre or from private contractors. The two-part relationship within the SNRA has made it even more important to verify the quality requirements for each activity within the contract between client and contractor and to follow up so that the requirements are fulfilled.
Despite the two party relationships the development of an easily handled quality assurance system is extremely important also in an in-house production.
The ProData is very promising and it's only our own fantasy that puts the limit for the use in the future.
So far we have over 500 GPS/Handterminal units in operation within the SNRA Construction and Maintenance.