

The system of winter and summer maintenance of national roads operating in GDDKiA* Poznań Division

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Poznań Division of GDDKiA administers a network of 1420 km of national roads in Wielkopolska Voivodeship. The maintenance of such an extensive road network was a serious challenge for its administrator, particularly during a winter period. The situation became even more difficult when after a road administration reform in 1991 the personnel, plant and equipment, especially modern means of transport, were largely reduced in the divisions of GDDKiA.

The fact is that for a correct organisation of winter road maintenance (WRM) in the Poznań Division, 48 salt spreaders with carriers and about 200 transport vehicles for plough installation and also over 70 graders, bulldozers and loaders are needed. Due to economic changes in Poland which commenced in the 90-ties the structure and ownership of most of big state-owned transport companies were changed and transformed into small private companies. Therefore, an appropriate fulfilment of transport and equipment needs for Poznań Division in respect of only the winter maintenance entailed signing 100 – 150 contracts a year for winter services, and not much less than this number for summer.

Such organisation of winter and summer road maintenance required a huge work input from engineers and technicians of the Divisions, especially from the staff working in Districts. The staffing in the districts appeared to be insufficient to supervise the operation of external equipment and simultaneously being on a winter maintenance duty in District offices and in the offices of linear service, i.e. in road precincts.

Given the above problems, a decision was made by the Poznań Division in 1999 to make the attempt and sub-contract the execution of winter and summer road maintenance. The basic assumption of that system was that the whole of the works connected with WRM and most of basic summer road maintenance works would be executed by third companies selected in the process of tender procedures.

The WRM works include:

- Providing and proper preparation of necessary equipment,
- Gathering relevant material reserves (road salt),
- Being on duty in linear service bases,
- Continuous slipperiness elimination and snow ploughing,
- Reporting to an on-duty officer in the District with regard to the condition of roads and the executed work.

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The summer road maintenance works include:

- Partial repairs,
- Shoulder maintenance and drainage (ditches),
- Grass-cutting and clearing the road belt,
- Cleaning road signs, boards, posts and guardrails.

As a result of a tender procedure conducted in 1999, six companies were selected and signed 5-year contracts (earlier an agreement of the President of Public Procurement Office had been obtained). The contracts consisted of two parts and included works in summer and winter on a national road network ranging from 245 to 288 km under one project (in respect of 1 carriageway). As far as the part concerning WRM works was concerned the tenderers were asked to offer only two unit prices.

These were:

- A price for a single slipperiness removal at a road section of 1 km over a full width of bitumen pavement;
- A price for snowploughing of 1 km long road section with shoulders at the width "from post to post".

Therefore, a tenderer, when calculating his price, had to take the following elements into consideration:

- A purchase of a suitable number of salt spreaders to ensure a correct execution of the project (1 salt spreader for about 30-35 km of road);
- A purchase and haulage of salt to indicated places of material storage;
- Mobilising a team of on-duty officers in individual linear services offices;
- Establishing a system of patrols and surveillance of road network within the contracted area;
- Third party insurance to cover the risk of maintaining roads to a defined standard;
- Indirect costs connected with the operation of equipment taking into account average distances of equipment travel to the place of operation;
- In addition, each tenderer had to include in his calculation the purchase and installation for the Employer from three to four weather stations, the locations of which were given in the Detailed Technical Specifications. In that way Poznań Division built up a primary network of 20 ASPG weather stations which was developed to reach 39 stations in the following years.

Hence, the execution of works by individual companies at WRM consists in the preparation of materials and plant for winter season and in maintaining individual roads up to their assigned standard during winter. The commencement of such winter activities is up to the contractor and it is the contractor's duty to organise the works in such a way as to be able to maintain the assumed road standard. On the basis of weather forecasts received from the Division, the contractor's on-duty officer notifies the District Manager, or a person authorised by him (most often it is the WRM on-duty officer) of the intention to proceed with an intervention on the road.

Consequently, the role of the road administrator (the Employer) boils down to the surveillance and assessment of the correctness of the activities undertaken by the contractor. This is realised by the Employer's own observations coming from road

patrols, by the data from weather stations and computer-stored records from the computers in salt spreaders.

The above-mentioned system of the works execution at the road winter maintenance has the following advantages from the point of view of the Poznań Division:

- It allowed changing the quality of the executed works immediately and radically which was related to the removal of old inefficient sand lorries.
- The purchase of equipment which should be the domain of the contractors, did not have to be funded from the state budget (salt spreaders, „unimogs”, ploughs, etc.) and therefore the financing could be spent on the development of technical facilities of the road administration, such as systems of notification, monitoring and surveillance.
- There were no problems with repairs or maintenance of salt spreaders or with the hire of carriers for medium-weight and heavy ploughs.
- The system allowed minimising the “everlasting” problem of paying for winter on-duty services. The road administrator is responsible for providing an on-duty service only in the District or in the Division.
- The number of documents and invoices was reduced. There are only six contractors and there is no need to arrange for any salt supplies, equipment repair, and carrier hire for salt spreaders and ploughs, which allowed reducing the number of people in the Division and the Districts who were directly involved in these activities.
- Combining the summer and winter maintenance allows an efficient use of the most expensive equipment, i.e. “Unimogs”.

The cost analysis of WRM costs carried out during the first contract, i.e. between the years 1999 and 2004 showed that the unit prices for maintaining 1 km of road to a 2nd standard level in individual winter periods ranged from 5000 PLN per 1 km to 7000 PLN per 1 km and were lower than average unit prices calculated for 16 Divisions which ranged from 6750 PLN per 1 km to 8000 PLN per 1 km, respectively.

Road administration should focus mainly on the problem of a further development of the system of road pavement condition remote surveillance and of contractors' operations.

Traditional supervision through inspections and road patrols should only be an element supporting the management of road maintenance. The problem becomes more urgent with continually increasing personnel costs and a small number of staffing.

Funds planned for investment purchases should be spent on a further development of the weather station system by increasing the density of the station distribution, providing cameras and light panels as well as software to facilitate the most efficient ways of alarm and information transmission including a systematised record of all data. In addition, the development of the Division's own base of salt shelters is a very important problem which is strategically significant in arranging the WRM properly.

Therefore, in advance of the above problems, tender specifications for 3-year contracts (for years 2004 – 2007) included relevant items imposing certain obligations on the contractors who had to purchase computers for all road precincts,

where WRM service contractors carry out their duties, and to equip all salt spreaders with GPS sensors and salt sensors. Poznań Division itself purchased suitable software which was installed in all road precincts, on the computers of WRM on-duty officers in the Districts and on the computer of the on-duty officer in the Road Information Station at the Division head office. This software facilitates a continuous monitoring of the operation of all 48 salt spreaders working at WRM, work and data recording, which is then used in work auditing and invoice checking. In the future, after the system has been fully implemented, it will be possible to equip all plough carriers with GPS sensors.

Furthermore, in order to make a continual observation of the road situation easier for the WRM on-duty officers, a construction of 1 missing ASPG station and the development of the camera system, based on the existing 40 weather stations from the current 4 colour cameras to 25, are planned. The above tasks are being implemented at the moment.

A consequence of the above actions must be a further improvement of our road services' qualifications to take advantage of the more and more sophisticated techniques, and thus a development of a suitable system of trainings.

In my opinion, the described system, which has been operating in our Division for 6 years already, has proved to be working well to the extent that it is worthwhile to continue its application bearing in mind that it needs to be improved and modified continuously so that it can meet the requirements of the existing legal system and at the same time increasingly bigger challenges placed before the road administration.

Poznań, 8 September 2005.