

C 3.4 WINTER MAINTENANCE

Recommendations to Decision makers

Road transportation has continued to increase markedly over the last few decades making it extremely important, from an economic perspective, to keep roads available and people and goods moving safely. Winter road maintenance services are important to road users in all areas affected by adverse winter weather conditions. Most jurisdictions around the world now rely to some extent on the private sector for their delivery. However, there is considerable variability in the approach and extent of contracting, in the types of contracts, and in the nature of the firms providing the services.

The reasons for these often marked differences, are complex but include legacy issues, the severity and duration of winter weather conditions, recent major political transformations and the degree of willingness to privatize services traditionally provided directly by the administration. The planning and delivery of winter road maintenance services remains a major challenge because winter weather phenomena display considerable variability in types, intensity, extent and duration and remain difficult to predict with a very high degree of accuracy. In such a context, it is a challenging exercise to contract for services in a fair and equitable manner while ensuring optimal financial resource utilisation balanced against the establishment and maintenance of appropriate service standards.

A key to success is gaining a complete understanding of the weather and its impacts on the roadway. This is achieved by collecting and quality-controlling as much road weather data as possible and disseminating it widely but doing so requires good collaboration across agencies and departments. These observing systems bridge the transportation and meteorological communities which further complicates data access and the establishment of data standards. The value of building a relationship between these two communities gives rise to many new opportunities. Finally, there is a need to think winter maintenance at every stage of planning a road.

Technical aspects

The levels of winter road services must be very clearly defined and well understood by all parties. The check procedures for the desired end-state road condition must be developed by establishing suitable indicators and methods of measurement. The question remains, should methods be prescribed or simply the objective? What metrics would one use to compare costs between countries? Which is the method of payment best suited to this type of service: a fixed price for work performed to a specific standard or by some fixed hourly rate? The answers to these questions differ from country to country.

In most nations, data from road weather information systems is now collected and used to better manage winter roadway maintenance operations. Considerable work remains to completely integrate road weather data into decision support or resource management systems and this work is both important and pressing. This is why international standardization initiatives are needed to provide common methods for acquiring and processing road weather information. This would greatly facilitate the establishment of links for data sharing between organizations as well as pave the way for the sharing of information on best practices leading to enhanced international harmonization.

In assessing the environmental impacts of winter maintenance operations, all of the parameters should be considered. This extends beyond just the chemicals and additives used to encompass the full environmental impacts of the entire maintenance operation. The analysis should include full life cycle costs. Administrations are striving to minimize salt consumption and to optimize their winter road maintenance operations. Yet the efficiency of such changes in strategy is not known unless the impact on water resources, vegetation and soil is investigated. It is important to continue to test innovative approaches against a socio-economic model to assess the consequences of changes in maintenance strategies for road users, for the road administration, and for society at large.

A lot of excellent work has been done to support winter road maintenance operators but further development and integration of road weather information systems and winter maintenance management systems together with other systems and data sets is required to meet the entire spectrum of future requirements of road maintainers and road authorities from performance tracking to crew call-outs and documentation. Data issues are fundamental to successful deployment and expansion of Winter Maintenance Management Systems (WMMS).

There is also an urgent need to enhance winter maintenance services for pedestrians and cyclists to increase the use of these modes of transportation during the winter months. The potential resultant decrease in short car trips would be beneficial for the environment as well as decreasing the number of winter road condition related traffic accidents and injuries.

Finally, with the climate of the world changing, we face new challenges to determine the impacts of those changes on the entire transportation system; a necessary first step to then pro-actively manage those impacts.

Recommendations to PIARC

Based on all what was learned at the Winter Seminar held in Riga, Latvia in 2005, the International Winter Road Congress held in Torino-Sestrière, Italy in 2006 and the 100th anniversary World Road Congress in Paris, France this year, there are several conclusions and recommendations. To begin with, the winter maintenance communities as well as the broader road transportation community need to establish better ways of sharing the many success stories presented at these international forums. Some easier means is required for following-up with colleagues to work through the many implementation details from a Congress presentation where time constraints allow only a brief overview. We must develop quicker, easier technology transfer mechanisms. One approach, particularly suited to publicly owned solutions that can be recommended now is the use of open system design principles wherever possible.

At the last PIARC International Winter Road Congress we learned that many components of Winter Maintenance Management Systems have been deployed and are being used operationally. Likewise, we learned that only a few end-to-end systems are being used at this time. Over time, we see an increasing level of complexity and integration of these systems along with a variety of implementation approaches. While one would expect to see these different approaches across jurisdictions, there is a need to ensure that we are not duplicating efforts. We also need to ensure we include and learn from the countries in transition. Finally, we should explore multiple on-going ways to share technology and knowledge beyond just the Congresses themselves.