

# THE C4 TECHNICAL COMMITTEE AND SUSTAINABLE WINTER SERVICE IN ROAD TUNNELS

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## SUMMARY

Which are the reasons which brought the committee “C4 - Road Tunnel Operations” to organize for the first time a specific session on the problems of winter viability in the road tunnels? How is this session organized? Which are the C4 committee's expectations from this session?

## KEY WORDS

TUNNEL / MAINTENANCE / OPERATION



## **1. INTRODUCTION**

The Committee of the road tunnels celebrated its 50 years of existence at the time of the last road congress in Paris in 2007. Created in 1957 with the name "Road tunnel Committee", it performed its slate of activities up until 1996. It adopted the name of "Technical Committee for Road Tunnel Operations" to reflect that its focus had shifted away from the construction of the underground infrastructure and towards dealing with the actual use of roads and accompanying facilities, i.e. geometry, equipment and its maintenance, exploitation, safety and environmental impacts.

### **1. WHY A SPECIFIC SESSION FOR ROAD TUNNELS?**

This committee is very productive since that it produced no less than 24 reports at the time of 3 preceding PIARC cycles and that it envisages producing 11 new reports during the current cycle. It also took part in many international conferences and organized many seminars. However it never took part as committee in one of the PIARC winter road congress. However road tunnels, as element of the general road network, are also subjected to the winter conditions and know specific problems.

The committee wanted to fill this gap and proposed to hold a special session dedicated to the problems of sustainable winter viability in road tunnels at the time of this XIII<sup>o</sup> international winter road congress.

### **2. THE PROGRAM OF THE SESSION**

For this first session dedicated to the tunnels winter viability, it was decided to present some cases representative of the various kinds of encountered problems. These problems occur primarily in the areas where the winter temperatures are very low, primarily in Nordic areas and mountainous areas.

The session will start with the presentation of the winter exploitation of the road tunnels on the plain of Quebec, by taking as case the tunnels Louis-Hippolyte La Fontaine and Ville-Marie Viger. These tunnels located one under the maritime way of the St-Laurent river and the other in the heart of downtown Montreal must be able to be used by the users in a well-lit scrupulously monitored environment that is sheltered from harsh weather conditions such as snowstorms, freezing rain, strong winds and blowing snow. However, the operation of such tunnels in a northern environment, surrounded by a significant water table and subject to severe weather conditions (major fluctuations and intense cold), poses many operational challenges and requires a wide range of extra equipment that is not found in other road tunnels. This equipment must be kept operational and periodically maintained. This presentation will deal with problems related to the winter management of tunnels and their various systems, which liken them more to an industrial production plant having to operate under extreme weather conditions than to a road segment from which snow has to be removed.

The second presentation will be devoted to the problems of winter viability of plain or mountain tunnels with not covered rock faces. It is the case of the majority of the tunnels in Sweden. They are often subjected to problems of water infiltration and ice formation during winter. We will see how to fight against the icicles formation and how to proceed for the tunnel cleaning operations by great cold. The problems of drainage and corrosion will be

also tackled. This talk will treat philosophy used in the Swedish standards for the new tunnels design and the old tunnels rehabilitation.

The last presentation will relate to the winter maintenance of tunnels in North-Eastern Minnesota. We will see in particular a real case of sustainable winter viability. These tunnels are furnished with tiles which are designed to create a clear environment inside the tunnels. During the winter season, the tiles get covered with ice reducing chemicals and grime. Due to the proximity to Lake Superior, all cleaning products and wash water must be recovered and disposed into a treatment facility. This talk will detail in particular the special procedures that have been developed for completing this work in an environmentally sensitive manner.

### **3. EXPECTATIONS**

By these four general presentations of the problems encountered in road tunnels maintenance actions during winter conditions, the committee wanted to initiate a reflection on this topic. These presentations will be followed by a questions – answers session then it will be requested from the audience to deliver its opinion on the continuation of this initiative either in the form of similar sessions to organize for the next congresses, or in the form of the drafting by the committee of a technical report specific to these problems during the next PIARC cycle, or in the form of a specific chapter in the future road tunnels electronic encyclopaedia under development. The proposals of the audience will be discussed during the next C4 committee meeting and, if necessary, at the time of the constitution of the program proposal of the committee for the next cycle.