Conférence Européenne
des Directeurs des Routes

Conference of European
Directors of Roads

Technical Report 2018-01
CEDR-PIARC Winter maintenance workshop
Users' needs at the heart of winter service

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WORLD ROAD
ASSOCIATION
MONDIALE
DE LA ROUTE

AIPCR PIARC

July 2018

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Summary

CEDR working group 3.4 Winter service was tasked with preparing a programme for the workshop on the topics of winter maintenance and service. Workshop was to be organized at the occasion and in parallel with WRA-PIARC 15th International winter road congress in Gdansk, Poland in February 2018.

The group was also given the mandate to liaise with winter service experts from WRA-PIARC and coordinate the programme with them in order not to duplicate contents with the rest of the technical sessions at the congress.

The official title of the workshop was drafted as ***Users' needs at the heart of winter service*** and its intention was:

- to exchange best practice in addressing users' needs in winter conditions,
- provide examples and solutions for road infrastructure owners and managers in their interaction with different categories of road users,
- ensure added value by collaboration with WRA-PIARC experts, and
- encourage other CEDR working groups and PIARC technical committees and task forces to enhance the cooperation between the two associations.

After the consultation within the working group and coordinated with PIARC Technical committee B.2 Winter service, it was decided that the topics of the workshop should be dealing with:

- interaction with road managers (NRAs and other),
- operational issues of different types of road users,
- standards in winter service.

The workshop was operationally carried out on the 22nd February 2018 at the Amber Expo conference centre in Gdansk as planned. It was successful with reasonable attendance and with quality speakers and topics. First feedback from the participants as well as from the speakers was very positive for both sides – CEDR and PIARC.

Speakers came from Germany, Italy, Hungary, Poland, Slovenia and Spain. Titles of their presentations were:

1. *New developments concerning winter maintenance on bicycle lanes*
2. *Winter road maintenance 4.0: how the technology improves safety and efficiency of drivers*
3. *Road users' expectations and opinions: a survey concerning winter road service in Hungary*
4. *Winter maintenance of national roads in Poland - methods and forms of effective communication*
5. *Winter maintenance on roads and railways in Slovenia*
6. *Determining the standards in winter service*

Workshop proved to be a valuable opportunity for experts to see what kind of strategies and activities states are using in their communication with various categories of drivers and their different needs. Collaboration with WRA-PIARC again proved valuable and is to be expanded either on this and/or possibly other topics.

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1. Preparation of the workshop

1.1 Composition of the working group

All-together, ten countries supported this activity in the *CEDR Action plan 2017-2019* and decided to delegate their experts. These countries were:

- Austria,
- Finland,
- Germany,
- Hungary,
- Italy,
- Netherlands,
- Norway
- Poland,
- Slovenia (leader),
- Spain.

Norway reported soon after the beginning of the work that they are cancelling their participation to this group and called off their representative, so nine countries participated at the end.

1.2 Drafting the programme

The group started working on the preparatory activities based on their experience from organizing the workshop on the topic of MDSS (maintenance decisions support system) in winter service in 2016, in Warsaw. First contact to the working group members was made by the group leader in April 2017, informing them about the start of the activities and inviting them to Ljubljana for a live meeting.

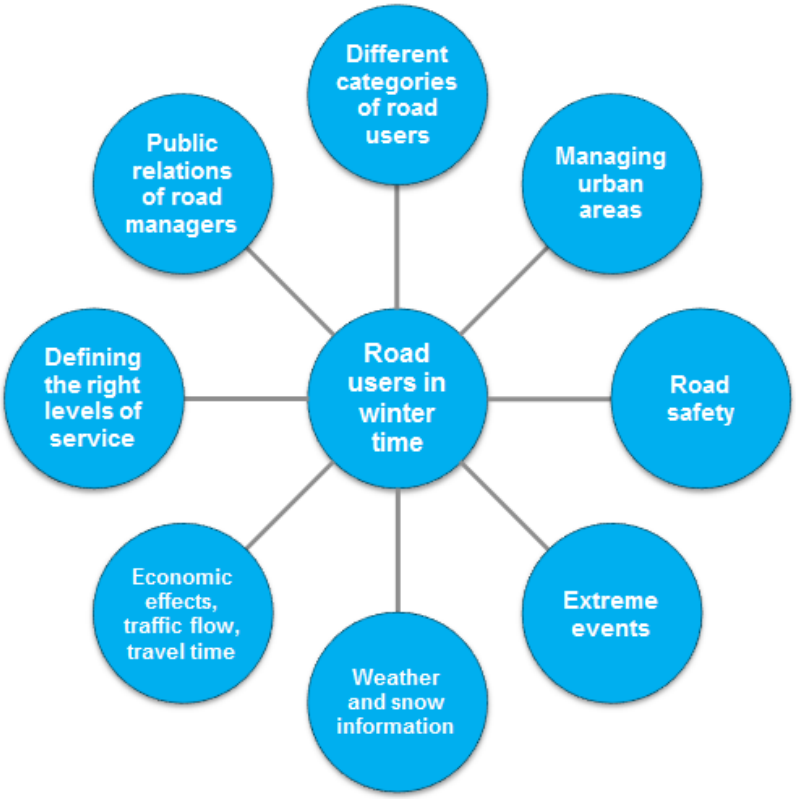
1.2.1 Meeting in Ljubljana

The meeting was held on 7th June 2017 in Ljubljana, Slovenia with the participation of representatives from 3 countries out of 9 that expressed their support to the group.

Group leader presented the background of organizing the workshop, the wishes of CEDR EB and GB, the proposed venue of the workshop and he also informed colleagues about the exchange of information with WRA-PIARC. It was advised to the group to take note of the already issued topics for the congress papers and not to duplicate these topics. However the group should try to form a program that would be complementary to the congress topics.

Discussion at the meeting touched various topics of winter service and maintenance, such as but not limited to:

Figure 1: Some of the topics, discussed at Ljubljana meeting



Participants further supplemented and compared above mentioned topics with the ones, identified from the official programme of the WRA-PIARC winter congress (to be interesting for the workshop):

- Extreme situations, disasters
  - communication plans and management of crisis information
- Climate change and the environment
- Road weather information
  - best practices in using road weather information including; increasing user acceptance and public support, dissemination of weather, traffic and operations information, the use of real time information
- Road users and road safety
  - types of road users and their special requirements for winter maintenance (e.g. lorries, cyclists and pedestrians)
  - economic effects of winter and winter maintenance, better traffic flow, travel time reliability
  - communication and road user information, social media, user feedbacks, complaint management;
  - driver education for winter driving
  - global advice and information to users when travelling
- Winter maintenance management and planning

  - road users' needs; how to define the right level of service
  - relationships between all parties / stakeholders (managers, operators, road users etc.)
- Equipment and products
- Winter service in urban areas
  - treatment methods and vehicles for winter on bicycle lanes
  - how to create a continuous bicycle lane network with different types of infrastructure during winter?
  - sidewalk and pedestrian areas, accessibility, tactile paving maintenance
- Tunnels and bridges
  - implications of winter event or winter operations on the behaviour of the users

We then drafted the topics for speakers to further discuss and coordinate them with colleagues from TC B.2:

- What are the users' different special needs in winter time? What kind of information they expect/need in winter time? (car drivers, truck drivers, cyclists…)
- How can/must NRAs address these needs and provide information to the road users? (taking into account the special circumstances of winter weather)
- Education of road users for winter driving/behaviour on roads
- What technologies are available for providing the information to the road users?

The conclusion of an otherwise successful meeting in Ljubljana has been that group leader communicates these discussions and draft topics first to other colleagues from CEDR working group for eventual comment and second to colleagues from PIARC TC B.2 to further elaborate the topics with them.

1.2.2 Coordination with PIARC TC B.2

Coordination with WRA-PIARC was operationally carried out through an email correspondence with the chairman of the Technical committee B.2 Winter service, Mr. Didier Giloppe and with the deputy Secretary general of WRA-PIARC, Mr. Robin Sebille.

During July and August of 2017 a finalized draft programme for the workshop was prepared and we asked for feedback and input from members of TC B.2. The draft programme sent to the TC B.2 was as follows:

1. Education of road users for winter driving/behaviour on roads
2. Who should determine the standards in winter service: road users or NRAs?
3. Truck drivers as a special category of road users (their special needs and behaviour in winter time)
4. Maintenance of bicycle lanes in winter time (in urban and especially outside urban areas)
5. Providing accurate and in-time information to road users in winter time (What kind of information they expect/need in winter time? - car drivers, truck/lorry drivers, cyclists… What technologies are available for providing the information?)

6. NRAs dealing with road users in winter time (How, to what extent can/must NRAs address the needs and provide information to the road users? How can NRAs run a successful PR campaign in winter time?) - the expectations of road users are always very high in winter time; they pay for the service and then they demand/expect drivable and clean roads 24/7; but NRAs can't provide that 100% because of budgetary and other constraints

Their reply was that the technical committee will discuss the congress programme and also the programme of CEDR/PIARC workshop at their next meeting at the beginning of October 2017 in Trondheim, Norway. At that meeting they will also officially include the workshop in the programme of the congress and designate it a venue and timeslot.

In the meantime we got a confirmation from organizers of the congress from Poland that the workshop will be included in the official programme of the congress and also publicized accordingly.

1.2.3 Finalizing the contents of workshop programme and speakers

The reply from TC B.2 after their meeting in Trondheim was that "that the subjects were too close to the subjects of the congress". Therefore they proposed their own list of possible topics:

1. Winter service standard
   - Definition of level of service: means or objectives
   - Principle of allocation of service levels, possible variations.
   - Performance indicators and measures, definition and use
   - Should there be a European strategy for levels of service?
   - How to define the rigor of winter on road network: consider a winter index declinable on Europe?

2. Cross border and general rules
   - What is the value of harmonizing regulations at a European level?
   - What should be prioritized?

3. A European Communication
   - Coordinating voice and communication at European level
   - Standardize messages
   - What information to give, what formatting, how to ensure a good understanding by all

And some further topics for discussion, such as: Winters tyres snow tyres when and where? Studded tyres, chains and socks; Authorization to overtake winter service vehicles; Specificities of the Highway Code and road signs; Creation of convoys; Storage of lorries, etc.

After reviewing all the propositions and comparing that again with the already drafted programme, the final proposal for the workshop programme was elaborated:

Contents will cover three categories of topics:

- **Category 1**: Interaction with road managers (NRAs and other)
- **Category 2**: Operational issues of different types of road users
- **Category 3**: Standards in winter service

Topics for presentations that were offered to the potential speakers were:

- Multimodality in winter time – operational reality or just wishful thinking?
- Determining the standards in winter service (who should determine the standards: road users or NRAs? Is there the need to harmonize regulations for winter service at a European level? Should there be a European strategy for levels of service?)
- Truck drivers as a special category of road users (their special needs and behavior in winter time, creation of convoys)
- Maintenance of bicycle lanes in bad weather conditions (in urban and especially outside urban areas)
- Running a successful PR campaign in winter time?
- Measuring the satisfaction of road users in winter time (performance indicators and measures, definition and use; the expectations of road users are always very high in winter time; they pay for the service and then they demand/expect drivable and clean roads 24/7; but NRAs can't provide that 100% because of budgetary and other constraints)

This programme was then agreed also by PIARC TC B.2 and we began sending emails and notifying all involved in the preparation of the programme, to propose the speakers. Speakers were finalized at the end of January 2018 (for speakers' CVs see Appendix II).

1.2.4 Finalizing the official agenda

After having finalized the content, the official agenda (see Appendix I) was also finalized. The event itself was envisaged to include six presentations and after the coffee break a live discussion at round tables would follow. This proposal was also communicated to PIARC, asking the organizers to provide the seating arrangements and tables in the room accordingly. The response from WRA-PIARC was positive in this respect.

For the purpose of stimulating the discussion at round tables, four questions were prepared and coordinated with PIARC representatives:

1. What would you estimate is the general opinion/public image of NRA in your country as regards winter service? Do users appreciate or rather argue its actions? If necessary, how would you improve it?
2. What do you think about obligational education of drivers for winter driving? Do you support/oppose to that idea? If obligational, who should organize and pay for it?
3. Is there the need to harmonize regulations for winter service at a European level? Should there be a European strategy for levels of service?
4. What is your opinion on multimodality in winter service? Do you think it is (or will need to become) doable in the future? Or should different transport modalities plan and execute their own winter service?

2. The course of the workshop

The workshop was carried out on the 22nd February 2018 from 8:30-12:30 in meeting room No.2 at the Amber Expo conference centre in Gdansk, Poland. The workshop was opened by CEDR group leader who later moderated the event. In the name of CEDR, Mr. Roman Limbach, member of CEDR Executive board from Germany, welcomed the participants and said some introductory words, emphasizing amongst other things successful cooperation between CEDR and PIARC.

Technical presentations followed. As the seating arrangement in the conference room was positioned in “classroom” rather than “round tables” as agreed, the leader decided to adapt the agenda and course of the workshop accordingly. He informed the participants that there will be no planned discussion in round tables and that the Q&A is possible all the way during the workshop. To make good use of time, the moderator also decided not to time-limit the speakers.

At the second half of the workshop Mr. Robin Sebille from WRA-PIARC General secretariat joined the workshop and welcomed the participants on behalf of WRA-PIARC. He apologized for his absence at the start of the workshop and informed the participants that the presentations of the workshop will be available on WRA-PIARC’s website. He also proposed that an article be written about the workshop which will be published in the next edition of Routes/Roads magazine. He expressed his content with the workshop and cooperation between CEDR and WRA-PIARC and invited participants for further cooperation on other topics.

The workshop successfully finished 10 minutes ahead of scheduled time.

2.1 Technical presentations

There were two introductory presentations. First was done by the leader of CEDR group who made a presentation on the background of choosing the topics and organizing the workshop. He summarized the activities of the past year that are also precisely reported in this document.

Second one was the presentation by Mr. Didier Giloppe, the chair of PIARC TC B.2 who presented current and planned activities of the technical committee on winter service. After Mr. Giloppe's presentation followed technical presentations from 6 countries.

For all presentations see Appendix III, electronic versions are available in CEDR General secretariat.

2.1.1 Technical presentation 1 – Germany

Speaker from Germany was Mr. Horst Hanke and he gave a presentation with the title *New developments concerning winter maintenance on bicycle lanes*.

He spoke about bicycle use in Germany in general, legal duty of winter maintenance on bicycle lanes, actual situation of winter maintenance, traffic characteristics in winter time and about new techniques for maintaining bicycle lanes in winter.

2.1.2 Technical presentation 2 – Italy

Actually three speakers came from Italy, that together gave 2 presentations. First presentation was given by Mr. Enzo Giletta with the title *Winter road maintenance 4.0: how the technology improves safety and efficiency of drivers*. Mr. Giletta presented new software tool and application that was developed within the project *Assist*. The software was designed to relieve the snowplough driver of considerable amount of tasks while driving (from adjusting the snowplough, salt spreading, coordination with other snowploughs, etc.).

Mr. Roberto Mastrangelo started with the second presentation with the title *Winter maintenance 4.0*, which was then taken over by one of his colleagues. This presentation focused on the communication of winter service vehicles with road infrastructure (smart road), also further elaborating the software system presented in previous presentation by Mr. Giletta.

2.1.3 Technical presentation 3 – Hungary

Speaker from Hungary was Mrs. Ibolya Bali and she gave a presentation with the title *Road users' expectations and opinions: a survey concerning winter road service in Hungary*.

She briefly explained the activities that road operator in Hungary is doing in relation to road users and information flow in their organization. The focus of her presentation however was on the survey that they carried out in Hungary among the general public (road users) and what kind of services they expect from road operators.

2.1.4 Technical presentation 4 – Poland

There were two speakers from Poland, Mr. Andrzej Kabzinski and Mr. Piotr Chalka, who gave a presentation with the title *Winter maintenance of national roads in Poland - methods and forms of effective communication*.

They first shortly presented winter maintenance in Poland in general and the rest of the presentation was focused on methods and forms of communication in winter service. Why communication is important, what kind of information are distributed, the importance of traffic communication centre, variable message signs, etc.

2.1.5 Technical presentation 5 – Slovenia

Speaker from Slovenia was Mr. Uroš Brumec and he gave a presentation with the title *Winter maintenance on roads and railways in Slovenia*.

Multimodality is becoming one of the more important challenges of modern transport authorities (also CEDR members). Uroš presented two modalities (road and rail infrastructure) and how they are dealing with winter maintenance in Slovenia, with more emphasis being on roads. Cooperation in practice is still not sufficient and efficient, it is under development, but obviously there are some common areas where a closer cooperation between road and rail winter service officers must be established.

2.1.6 Technical presentation 6 – Spain

Speaker from Spain was Mr. Luis Azcue Rodriguez and he gave a presentation with the title *Determining the standards in winter service*.

He first spoke about winter service management and then presented criteria and requirements for service levels that more or less are present in winter service standards in countries around Europe. He then proposed four criteria on which there is a theoretical possibility to base a common European winter service standard. He then moved to presenting the case in Spain and concluded that there is currently no political will to unify these standards.

3. Conclusions

For national road administrations and other transport managers, dealing with road users is an important part of their everyday activities. Knowing their needs and establishing a successful communication with them means that the road authority will enjoy a better public image. Consequentially that means more favourable public reactions to inevitable mistakes and in case of infrastructure failure. A well performing road administration knows that and nourishes such

connection with its users, with special attention given in winter time, when more severe road conditions present an added challenge for all parties involved.

The area of road users' needs proved to be a broad one with many different aspects. It was not the intention of this workshop to address all of them, but to present the ones currently or recently in development in some countries. The topics which were discussed were:

- Multimodality in winter time – operational reality or just wishful thinking?
- Determining the standards in winter service
- Truck drivers as a special category of road users
- Maintenance of bicycle lanes in bad weather conditions
- Running a successful PR campaign in winter time
- Measuring the satisfaction of road users in winter time

Diversity of the above listed topics prevents one from drawing any special conclusions on the content part of the presented issues. On the other hand, exactly this diversity drives us to the conclusion that road authorities can't tackle these issues so easily. They need to designate special personnel to address them. It also means that dealing with them requires the involvement and coordination of various departments, so one way or another, the whole administration is involved. Knowing different categories of road users, designing the standards of winter service with drivers in mind, maintaining special sections of road network (i.e. bicycle lanes), caring about people's feedback and opinion on your actions (PR), evolving multimodality for the ease of mobility – all in all constantly bearing in mind the end user in every work you do. That is the challenge.

Mentioned topics do not relate to winter time alone but are rather time-independent. The workshop can be viewed as a reminder to CEDR members not to forget that. Low involvement and participation to the work of the group for organizing this event proves that NRAs currently see their priorities elsewhere, not realizing these issues are actually touching on all their activities, not just winter service.

WRA-PIARC cooperation on preparing the programme again proved valuable, although being rather re-active then pro-active. With some initial communication short-cuts later coordination went well and a short article on the workshop is planned to be published in the Routes/Roads magazine of the association.

No special recommendations for the future work of CEDR on the subject of winter service or road users in that respect can be given at this point. We would like to encourage however any other CEDR working groups to further cooperate with the experts involved in the technical committees of WRA-PIARC. They are knowledgeable and ready to share, the only drawback being that a lot of times it comes to the chairing person to decide how much value will be given to the cooperation with organisations outside their own.

4. APPENDIX I (agenda of the workshop)

Official agenda of the workshop

Time	Content	Speaker
8:30 – 8:40	Welcome and opening of the workshop	CEDR and PIARC
8:40 – 8:50	Background on workshop topic	Bine Pengal
8:50 – 9:00	Presentation of the work of WRA-PIARC TC B.2	Didier Giloppe
9:00 – 9:15	*New developments concerning winter maintenance on bicycle lanes*	Horst Hanke
9:15 – 9:30	*Winter road maintenance 4.0: how the technology improves safety and efficiency of drivers*	Roberto Mastrangelo and Enzo Giletta
9:30 – 9:45	*Road users' expectations and opinions: a survey concerning winter road service in Hungary*	Ibolya Bali
9:45 – 10:00	*Winter maintenance of national roads in Poland - methods and forms of effective communication*	Andrzej Kabzinski and Piotr Chalka
Break		
11:00 – 11:15	*Winter maintenance on roads and railways in Slovenia*	Uroš Brumec
11:15 – 11:30	*Determining the standards in winter service*	Luis Azcue Rodríguez
11:30 – 11:35	Forming of the working groups (number of the groups depends on the number of participants; expecting max. 4 groups in round tables)	All
11:35 – 12:05	Work in the working groups (discussing on the prepared questions)	All
12:05 – 12:25	Reporting from the groups back to all participants (max. 5 min per moderator)	Moderators
12:25 – 12:30	Closing of the workshop	CEDR and PIARC

5. APPENDIX II (CVs of speakers)

Short CVs of the speakers

Horst Hanke
Mr. Hanke is a technical engineer and currently employed at German Road Administration. He has been working for more than 35 years in Roads and Traffic Research and Road Administration in the field of road maintenance but his special interest lies in winter service. He has worked on many winter service research projects, he is the leader of the German Winter Maintenance Group, Convenor of the CEN/TC 337/WG 1 Winter Maintenance Products, he has worked also in COST projects. He published many scientific papers on winter maintenance, he is a member of PIARC technical committee B.2 on winter service and a corresponding member of PIARC TC on Terminology.

Roberto Mastrangelo
Mr. Mastrangelo has worked as a project and site manager of infrastructural works in road as well as in rail sector. Since 2002 he works at ANAS S.p.A. and is currently responsible for network management and maintenance in the Directorate of Operation and Territorial Coordination. That includes protection of road assets, surveillance and early intervention in case of emergency in coordination with Police and the civil protection bodies. He is a member of PIARC winter service technical committees TC 2.4 (2012-2015) and TC B.2 (2016-2019) and a member of CEDR WG on winter service. He is also a member of several national associations and committees in relation to civil protection, road safety and crisis management.

Enzo Giletta
Mr. Giletta is a mechanical engineer that started his career in a family company Giletta S.p.A. From 2001 onward he is actively involved in winter service activities. He participated in the work for establishing the standard CEN TC337 “winter and road service equipment”, he is a member of the technical committee for winter maintenance equipment in Eunited association in Frankfurt. He is also involved in a number of national Italian technical committees and associations, related to research and innovation in winter maintenance. On international level he gave speeches in various congresses and events, related to winter service, such as The Nordic way congress in Sweden, IFAT Munich, Digital Industrial Transformation symposium in Unione Industriale Torino.

Ibolya Bali
Ms. Ibolya Bali has worked for the Hungarian Public Road Non-profit Plc. since 2006 and is already from 2011 a Head of Department for Road User Information Services.
Since 2011, she has been coordinating tasks related to the stand-by duty and road user information services. She is actively developing the support and information system of the company and since the beginning she has been taking part in developing the EasyWay and call centre systems. She has been playing an active role in the implementation of the CROCODILE priority project and her duties also include networking and relationship building with the company’s associated organizations and cooperating partners.

Andrzej Kabziński
Mr. Kabziński is a technical engineer and a specialist in the areas of road safety, traffic engineering, road transport and logistics. He is currently enrolled in postgraduate study of modern road

construction. He has been working for Polish road administration from 2008, first as a Road Safety & Traffic inspector, then as a Road Maintenance Supervisor and from 2013 as a Road Safety & Traffic Manager. He is also a consultant in the field of technical-forensic reconstructions of collisions and road accidents and a qualified Road Safety Auditor.

Piotr Chalka
Mr. Chalka has an education in Public administration, specializing in internal security and postgraduate in maintenance of public roads. He started his professional career in Mazovian regional administration for roads in Warsaw in 2008. He joined the General Directorate for National Roads and Motorways in 2014 and has since then worked there in crisis management and defensive preparations. From 2017 on he is currently acting as the head of Division for crisis management and defensive preparations.

Uroš Brumec
Mr. Brumec is currently employed at Slovenian infrastructure Agency and is working primarily in the field of road safety (mostly from the infrastructure point of view) and roads & traffic management. He especially endeavors for the implementation of latest solutions from the “human factor” point of view in road safety. He represents Slovenian infrastructure agency in international associations of WRA-PIARC and CEDR. He has more than 10 years of operational experiences in traffic management, ensuring smooth flow of traffic and logistic procedures. He regularly updates his knowledge through various domestic and foreign seminars and successfully implements it in everyday practice.

Luis Azcue Rodríguez
Mr. Rodríguez is a civil engineer. He has developed his career in the Ministry of Public Works, where he currently holds the position of Service Chief of the Subdirectorate General for Operation and Maintenance. In his professional career he has focused mainly on winter road service and today he controls the management system of winter road service information and carries out monitoring and annual analysis of the works performed. He is an active member of both WRA-PIARC and CEDR associations. For more than 15 years he has also participated as technical director, speaker and teacher in various national and international congresses and training courses, organized by the Spanish Association of Companies for Conservation and Operation of Infrastructures (ACEX) and th Technical Association of Roads (ATC).

6. APPENDIX III (presentations)

Presentation Bine Pengal

Users' needs at the heart of winter service

CEDR Conférence Européenne des Directeurs des Routes Conference of European Directors of Roads

WORLD ROAD ASSOCIATION MONDIALE DE LA ROUTE

Introduction to the workshop

Bine PENGAL – Leader CEDR W 3.4 Winter service

CEDR/PIARC workshop, Gdansk, 22nd February, 2018

- Background
- Intention of the workshop
- Wide variety of topics
- Workshop composition
- Proposed agenda
- Questions for discussion

Background

- Idea based on a successful workshop in Warsaw on April 2016 (MDSS; continuation of a cooperation with WRA-PIARC)
- CEDR working group 3.4 Winter service (CEDR Action plan 2017-2019)
- Participating countries: Slovenia (leader), Hungary, Germany, Austria, Italy, Netherlands, Poland, Finland and Spain

- CEDR Governing Board assigned W 3.4 to liaise again with WRA-PIARC experts and decide on a contents for a common workshop

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Intention of the workshop

- Exchange of best practice in addressing users' needs in winter conditions
- Providing examples and solutions for road infrastructure owners and managers in their interaction with different categories of road users
- Ensuring added value by collaboration with WRA-PIARC experts
- Encouraging other CEDR working groups and PIARC technical committees and task forces to enhance the cooperation between the two associations

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Wide variety of topics

Workshop composition

- Contents divided into three main categories:
  - Interaction with road managers (NRAs and other)
  - Operational issues of different types of road users
  - Standards in winter service
- Topics to be addressed at the workshop:
  - Multimodality in winter time (operational reality or just wishful thinking?)
  - Determining the standards in winter service (Who should determine the standards: road users or NRAs? Is there the need to harmonize regulations for winter service at a European level?)
  - Truck drivers as a special category of road users (their special needs and behavior in winter time, creation of convoys)
  - Maintenance of bicycle lanes in bad weather conditions
  - Running a successful PR campaign in winter time?
  - Measuring the satisfaction of road users in winter time (expectations of road users are always very high in winter time; they pay for the service and then they demand/expect drivable and clean roads 24/7)

Proposed agenda

Time	Content	Speaker
8:30 – 8:40	Welcome and opening of the workshop	CEDR and PIARC
8:40 – 8:50	Background on workshop topic	Bine Pengal
8:50 – 9:00	Presentation of the work of WRA-PIARC TC B.2	Didier Giloppe
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9:45 – 10:00	*Winter maintenance of national roads in Poland - methods and forms of effective communication*	Andrzej Kaczinski Piotr Chalka
10:00 – 11:00	**Break**	
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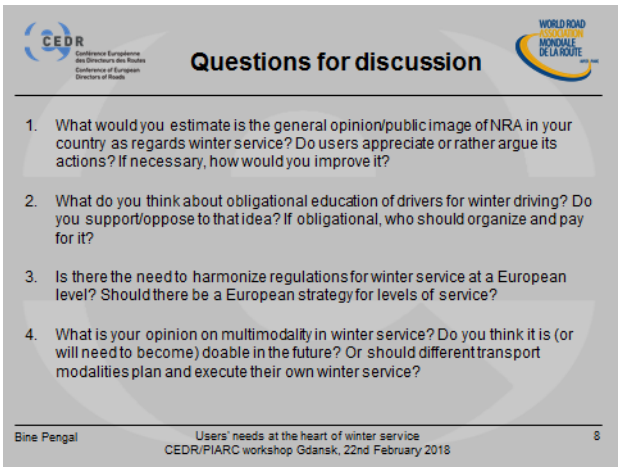
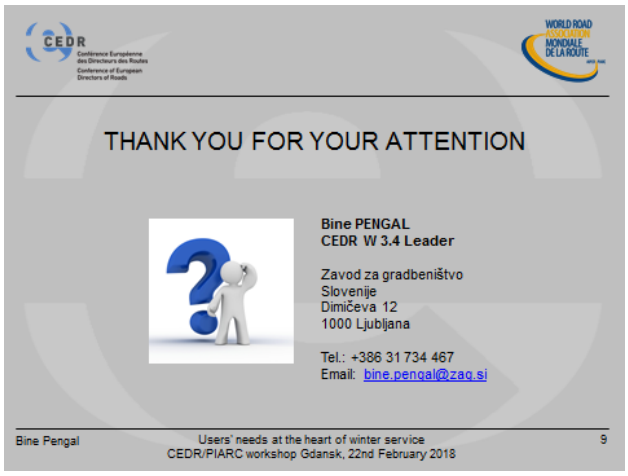
11:30 – 11:35	Forming of the working groups (number of the groups depends on the number of participants)	All
11:35 – 12:05	Work in the working groups (discussing on the prepared questions)	All
12:05 – 12:25	Reporting from the groups back to all participants	Moderators
12:25 – 12:30	Closing of the workshop	CEDR and PIARC



Questions for discussion

1. What would you estimate is the general opinion/public image of NRA in your country as regards winter service? Do users appreciate or rather argue its actions? If necessary, how would you improve it?
2. What do you think about obligational education of drivers for winter driving? Do you support/oppose to that idea? If obligational, who should organize and pay for it?
3. Is there the need to harmonize regulations for winter service at a European level? Should there be a European strategy for levels of service?
4. What is your opinion on multimodality in winter service? Do you think it is (or will need to become) doable in the future? Or should different transport modalities plan and execute their own winter service?



THANK YOU FOR YOUR ATTENTION

Bine PENGAL
CEDR W 3.4 Leader

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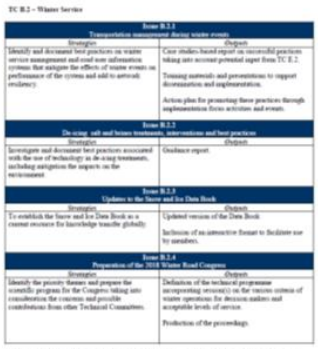
Presentation Didier Giloppe

Exchange knowledges and techniques on roads and road transportation

WORLD ROAD ASSOCIATION

www.piarc.org

CEDR/PIARC Workshop
Technical Committee B2 Activities
Didier Giloppé Cerema France



TC B.2 – Winter Service

Output B.2.1 Progress Steve Lund, Gabe guevara

The charge for working group B.2.1 is to identify and document best practices on winter service management and road user information systems that mitigate the effects of winter events on performance of the system and add to network resiliency. Specifically the working group's focus will be on:

- The integration of road network operators (those operating the system) with those delivering winter maintenance services; and/or
- The exceptional cooperation of transportation agencies across borders that enhance winter services received by the road user.

The term border is not only to mean country borders, but it is also meant to include situations where road or corridor ownership and operation is divided by jurisdictional borders within a country (such as across state or municipality borders).

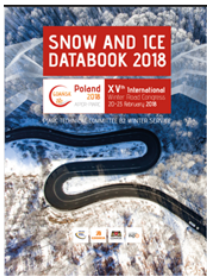
TC B.2– Winter Service

Output B.2.2 Progress Horst Hanke Peter Nutz

Content and Structure of the Report

1. Introduction: aim of the project
2. Execution of the questionnary; elaboration of the questionnaire; Questions; Participation
3. International standards and spreading techniques in Winter Maintenance
4. Guidelines and Spreading Amounts
5. Examples and Case Studies of International Winter Maintenance
   - 5.1. Preventive Spreading
   - 5.2. Pre-Wetted Spreading
   - 5.3. Liquid Spreading
   - 5.4. Spreading during Snowfall
   - 5.5. Spreading on Bicycle Lanes
   - 5.6. Education and Training of the Staff
   - 5.7. Public Relation and Information about Spreading Techniques

Snow and ice data book



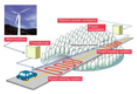
(French, Spanish, English versions)

- Each report contains 4 main themes
- Demographics and roads
- Climate
- Winter road management
- On-going research and studies

Snow and Ice Data Book is available at the PIARC web site.
http://www.piarc.org/
Free of charge for downloading

TC B.2– Winter Service

Output B.2.3 Alan Chambers Didier Giloppé



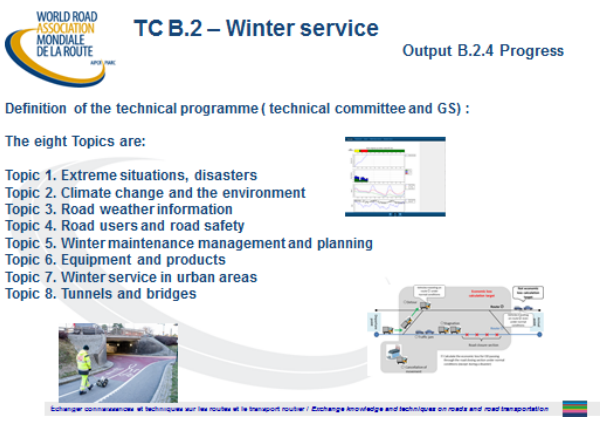
Update to Snow and Ice data Book

Number of countries: 31 countries have entries. Only 14 provided updates and there are 3 new countries.

Develop framework for Online Manual – Winter Roads Manual

During this cycle the TC will develop a framework for the manual and pass to the following TC. There will be no need for representation from various countries.

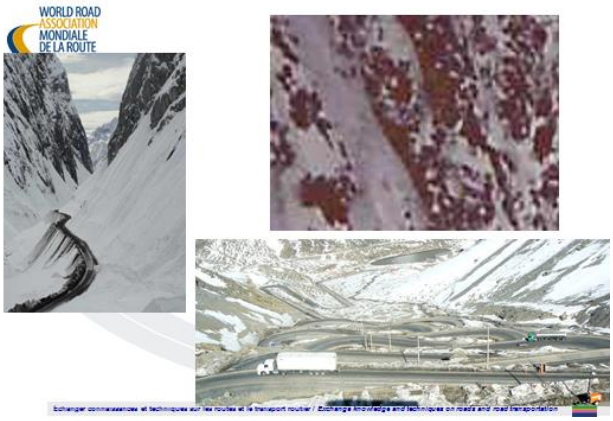

TC B.2 – Winter Service
Output B.2.4
Activities of TC B.2 for the congress
For the congress itself
- Before the congress to publish an article in R et R to present the program
- Definition of the technical program
- Selection of the communications
- Animation of the sessions
- Organization of the poster sessions
- Production of the congress minutes
- After the congress to publish a "special winter service R et R"
- Disseminate information concerning the congress in the TC member respective country
- Participation in the organization of the international snowplough championship
- Participation in the world congress of the road and the animation specific committee session

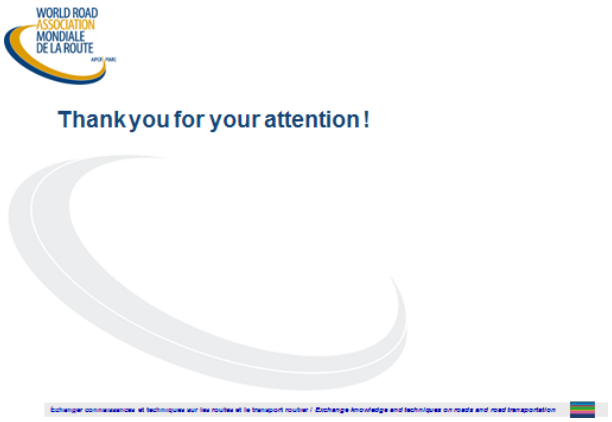

TC B.2 – Winter service
Output B.2.4 Progress
Definition of the technical programme (technical committee and GS) :
The eight Topics are:
Topic 1. Extreme situations, disasters
Topic 2. Climate change and the environment
Topic 3. Road weather information
Topic 4. Road users and road safety
Topic 5. Winter maintenance management and planning
Topic 6. Equipment and products
Topic 7. Winter service in urban areas
Topic 8. Tunnels and bridges


TC B.2 – Winter Service
Output B.2.4
Organisation of the snowplough championship
In Gdansk 9 countries
And 21 participants


TC B.2 – Winter Service
Output B.2.4
138 oral communications
170 Poster sessions
Expected 800-900 participants
And 2000 visitors
Production of the proceedings
Article in R et R
Etc….


TC B.2 – Winter Service
Seminar program
The last TC B.2 Seminars
- International Conference on Winter Service
- Mendoza, Argentina, 27-30 June 2017
- Attendees: 200 professionals, mainly from Argentina and Chile and 14 TC members
And the next in China




WORLD ROAD ASSOCIATION
MONDIALE DE LA ROUTE
Thank you for your attention !

New Developments concerning Winter Maintenance on Bicycle Lanes in Germany

CEDR Workshop
22.02.2018
Gdansk (Poland)

Dr.- Ing. Horst Hanke
German Road Administration

Overview

- Introduction: Bicycle use in Germany
- Legal duty of Winter Maintenance on Bicycle Lanes
- Actual situation of Winter Maintenance
- Traffic characteristics in Winter Time
- New Techniques and Experiences
- Outlook

Introduction: Bicycle Use in Germany

Introduction: Bicycle Use in Germany

- The use of bicycles has increased strongly in Germany in the last years
- Especially in towns and villages
- For normal working day traffic
  like for working, shopping, school and university
- At the same time bicycle lane networks in the towns have been expended and connected
- New developments are special rural speed bicycle lanes for connecting the cities and villages
- E-Bikes give an additional boom to the use of bicycles
- In former times bicycles mostly were used in summer times, but nowadays they are more and more used the whole year

→ Bicycle traffic volumes have increased in winter time strongly
→ Users expect a good winter maintenance in connected networks

Legal Duty of Winter Maintenance

Legal Duty of Winter Maintenance

- In Germany there exist legal regulations about duty of winter maintenance
- The situation on bicycle lanes is as following:
  - If the lane is such snow-covered that cycling will be no more possible there is a legal duty to remove the snow
  - A legal duty to spread is only given on lanes with important traffic (main connections) and on dangerous sections (like crossings or steep grades)
  - The spreading material is not regulated but it has to be effective to better the pavement condition
- Responsible for the Winter Maintenance are the cities and villages for the bicycle lanes in their area

Actual Situation in Winter Maintenance

Dr.-Ing. Hanke – Germany - CEDR Workshop Gdansk 2018

Actual Situation in Winter Maintenance

- Most of the cities in Germany do a special winter maintenance for bicycle lanes
- Especially the towns in the flat regions and the towns with universities serve a big network of bicycle lanes in winter time
- On the bicycle lanes the most important service is the removal of the snow, which is done as intensively as possible with plows or brushes
- Spreading is done only on a part of the lanes
- Problem is the spreading material:
  - Because most of the bicycle useres are interested in saved environment there is a big reservation to salt spreading
  - On the other hand abrasive materials are not suitable for a good grip and cause damages of the wheels
  - Because of the legal duty there must be spread on main lanes
- Most of the cities use salt in cases of slipperyness, but a problem is that the lanes have lower temperatures (compared to the roads) and the traffic does not help to distribute the spreading agents
  → more salt is needed

Dr.-Ing. Hanke – Germany - CEDR Workshop Gdansk 2018

Traffic Characteristics in Winter Time

Dr.-Ing. Hanke – Germany - CEDR Workshop Gdansk 2018

Traffic Characteristics in Winter Time

- Actually there is a rersearch project ongoing in Germany concerning traffic characteristics on bicycle lanes in winter time, final results we will have at the end of this year
- Traffic volumes are lower on days with winterly conditions but there is still an important part of the traffic going with bicycle in many cities
- Drivers are not as fast as on normal days but not enough adjusted to the bad surface conditions
- Accident analysis show an important rising of the risk of injuries for the bicyclists in winterly conditions, but it is very difficult to calculate this exactly because accidents are mostly not reported in the official statistics
- Winter Maintenance on bicycle lanes is very important and necessary for traffic safety in the urban areas
- The results of the ongoing research will 2019 give more details and recommendations for the winter maintenance

Dr.-Ing. Hanke – Germany - CEDR Workshop Gdansk 2018

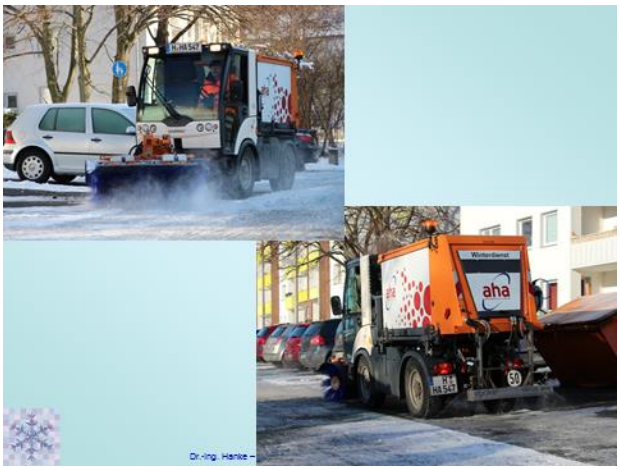
New Techniques and Experiences

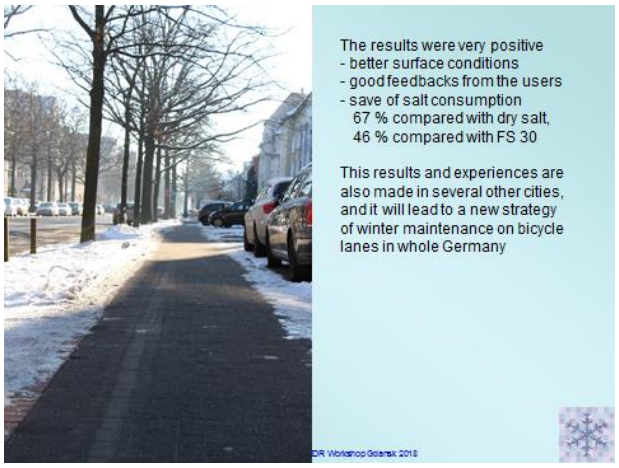
Dr.-Ing. Hanke – Germany - CEDR Workshop Gdansk 2018

New Techniques and Experiences

- In several cities in Germany there are tests with better quality of winter maintenance on bicycle lanes
- One example is the city of Hannover laying in the more flat region of Northern Germany and having a big volume of bicycle traffic
- There was tested to spread only liquid brine on bicycle lanes, and this was compared to normal winter maintenance with dry salt
- First tests in 2013/14, end of test 2017

Dr.-Ing. Hanke – Germany - CEDR Workshop Gdansk 2018





The results were very positive
- better surface conditions
- good feedbacks from the users
- save of salt consumption
  67 % compared with dry salt,
  46 % compared with FS 30

This results and experiences are also made in several other cities, and it will lead to a new strategy of winter maintenance on bicycle lanes in whole Germany

Presentation Enzo Giletta

BUCHER municipal

Winter Road Maintenance 4.0

How technology improves safety and efficiency of drivers

Enzo Giletta
Gdansk XVth Piarc Congress 2018

Actual situation in WRM

BUCHER municipal

- This is the 15th International Winter Road Congress
- 60 years of research in Winter Road Maintenance (WRM)
- Many countries and specialists have spent energy and resources to test new products and to define new processes to rise the level of service by reducing the economical and environmental impact
- In Europe there are groups of specialists working since 16 years to define standards to improve the performance of the WRM equipment
- The result is that today is well defined what to do in any condition, that is:
  - **Exact quantity of salt or brine to be spread with any kind of snow or weather condition**
  - **The mixture of salt and brine related to the snow or to the road surface**
  - The spreading width has to be correct with any road section, not to waste product
  - **The plough pressure has to be adjusted depending from snow or bridges joints**
  - The flow of snow has to be changed according to the infrastructure on the side

XVth International Winter Road Congress - 22 february 2018 2

Example of Italian motorway on Apennine

BUCHER municipal

25,8 km on the Apennine - Higher point 750 m on sea level

			spreader adjustment	plough adjustment	total adjustment spreader	plough	
bridges (HS reduced)	21	width		tighten on joint	63	126	
		dosage		clearing width			
		brine ratio					
Tunnels	11	start / stop spreading		up / down	22	22	
total adjustments					85	148	233
porous asphalt							
normal asphalt							
missing HS							
different lanes (1 , 2, 3)							
total							275

How one driver alone in the cab can safely drive and operate the equipment according to the procedures?
Driving at 50 km/h means a change every 6.5 seconds!!!
On a bridge 5 changes at the same time!!!

XVth International Winter Road Congress - 22 february 2018 3

Driver safety rules

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Forbidden to use the mobile phone but allowed the use of the control boxes having even more buttons and the joy-stick?

Spreader:
7 buttons + 3 knobs
with double function

Plough:
joy-stick with 8 functions + 7 buttons

no. 2 displays to control equipment

In 2014 an European tender issued by ESA required a proof of concept to automate winter maintenance operations to solve this problem; thanks to this, **ASSIST** project has been launched

XVth International Winter Road Congress - 22 february 2018 4

ASSIST project developed according to the ESA tender

BUCHER municipal

Partner in ASSIST project

BUCHER municipal

SMB

SAET

GeoVille

Alphaconsult

ASSIST
ADVANCED SNOW PLOUGH AND SALT SPREADER BASED ON INNOVATIVE SPACE TECHNOLOGIES

Winter road maintenance 4.0

The only automatic way to operate winter road maintenance , leaving to the driver the only task to drive the vehicle

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esa

ASSIST

BUCHER municipal

OVERALL SYSTEM ARCHITECTURE

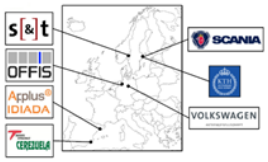
XVth International Winter Road Congress - 22 february 2018 6

esa ASSIST BUCHER municipal

FROM NEEDS TO ADVANCED SERVICES

COMPANION cooperative mobility solution for supervised platooning

- **Vision**
- Heavy-duty vehicles presently account for 17% of total CO_2 emissions. In order to meet European Union's goal to reduce greenhouse gases by 20 percent within 2020, it is paramount to improve global efficiency of heavy-duty vehicles
- Over the past two years, experiments on the Platooning concept have been conducted (trucks interconnected through V2V communication running at a very close distance) and showed that interesting fuel savings can be achieved thanks to the reduced aerodynamic drag
- The consortium is formed up by the following 7 complementary partners from 4 European countries (Sweden, Germany, Spain and The Netherlands), ensuring a widespread European coverage and impact:

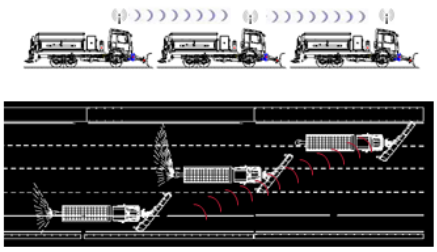


Future possible development

BUCHER municipal

Development for Winter Road Maintenance

- This system could be used for WRM, specially in ploughing operation when the vehicles work in "train" position, the front vehicle automatically guides the others, allowing to maintain a perfect position and a **perfect alignment between ploughs**



Summary: driver helps in WRM

BUCHER municipal

Today existing technology

- Mission created in office directly on a satellite map, linked to weather forecasting, with all the operations to be done
- Automatic control for equipment (spreaders, sprayers, ploughs, etc), able to receive the mission in real time, to receive correction determined by the weather forecast system via Cloud, **and to manage the spreader and the plough completely automatically**

Tomorrow's technology

- Automatic driving of vehicles operation in "train" for ploughing

BUCHER municipal

Thank you for your attention

Your contacts:
Enzo Giletta
enzo.giletta@buchermunicipal.com

Presentation Roberto Mastrangelo

Agenda

- WORKING GROUP
- WINTER MAINTENANCE 4.0
- CONCLUSION

WORLD ROAD ASSOCIATION MONDIALE DE LA ROUTE
AIPCR PIARC

Working Group: COMITATO TECNICO NAZIONALE B2: WINTER SERVICE

ENG. ROBERTO MASTRANGELO	ANAS S.P.A.
ENG. CARLO COSTA -	AUTOSTRADA DEL BRENNERO S.P.A.
DR. ENZO GILETTA	GILETTA S.P.A.
GEOM. IGINO LAI	STRADA DEI PARCHI S.P.A.
DR. DAMIANO PICA	SERVIZIO POLIZIA STRADALE
ENG. DOMENICO ZAGARI	TECHNOLOGY MANAGER

WINTER ROAD MAINTENANCE 4.0 1/2

Drivers are always calling for Highway Authorities to focus more closely on both the quality of the infrastructure and the transmission of information, particularly during the winter period when unfavourable weather creates challenging road conditions.

Being able to guarantee an efficient maintenance service across the network and above all provide increasingly demanding drivers with timely and accurate information, is therefore becoming more and more important.

Today, constant technological developments make it possible to implement road infrastructure management systems that boost traffic safety while also improving the quality of the services offered by maintenance companies and the quality and quantity of information drivers receive. All of this with due respect for environmental and economic sustainability.

WINTER ROAD MAINTENANCE 4.0 2/2

How is this achieved?

Roads are no longer just a physical structure made of steel, cement and asphalt but become a "technological infrastructure" that interacts with vehicles and therefore with the drivers using it.

The work carried out by the B2 Technical Committee has focused on the development of technologies relating to road infrastructure as well as vehicles and the equipment used to maintain this infrastructure, especially during the winter.

a. Smart Road

b. The vehicles

a. What is a Smart Road ?

The "smart road" is a new approach to roads, which sees these as a "technological infrastructure" that connects drivers and roads, providing access to an innovative range of services

- road dialogue systems
- Information directly by car
- SOS on Board via Smartphone
- Intelligent highway access management
- Real time Info-mobility
- Increasing of security level
- Monitoring via Internet of Things

CONNECTIVITY ..... WIRELESS ON THE MOVE ..... MOVING Wi-Fi

Wi-Fi
in motion

Wi-Fi
Vehicle To
Infrastructure
DSRC- ETSI ITS-G5

Wi-Fi in MOTION: The infrastructure features a number of access points distributed across the network in order to ensure efficient connectivity with mobile devices on-board vehicles moving at a speed of 130 km/h.

Wi-Fi Vehicle to infrastructure (DSRC – ETSI ITS – G5) : Specifically designed devices enable the exchange of information between vehicles and road infrastructure: OBU (On Board Unit), a device for on-board Wi-Fi connectivity in vehicles and RSU (Road Side Unit), a device for Wi-Fi connectivity across the entire road infrastructure.

CONNECTIVITY ..... WIRELESS ON THE MOVE ..... MOVING Wi-Fi

L'utente potrà usufruire in piena sicurezza e nel rispetto del codice della strada di diversi servizi

- SICUREZZA
- INFO MOBILITA'
- CONDIZIONI METEO
- SOS A BORDO
- SERVIZI ALLA LOGISTICA

All APP services are voice-activated while the vehicle is in motion; full accessibility is restored when the vehicle is stationary.

Using their mobile devices, drivers can gain access to information regarding SAFETY, TRAFFIC UPDATES and WEATHER CONDITIONS along any part of the route concerning them. They can also make EMERGENCY calls if they need to.

Type of information	Applications	Tasks	
Safety	Road safety information	Speed limit alert	Acoustic or text message alert sent via mobile device
		Dangerous points	
		On-board road sign alert	
		Car accident detection and notification	
	Warning signals	Car breakdown alert	
		Wrong-way driving alert	
		Adverse weather condition alert	
		Live roadworks alert	
		Rescue vehicle alert	
		Slow vehicle alert	
Traffic Updates	Services based on local monitoring	Information on traffic and recommended routes	Text message alerts
		Traffic conditions	
		Alternative routes	
		Assisted navigation	
		Road closure alert	
		Motorway service area information	
		Points of interest information	
Weather conditions	Journey planning	Rain, snow, ice, wind, temperature, etc.	Mobile app
On-board emergency alert	Emergency	Emergency calls to: police, medical emergency services, operating theatre.	Mobile app for automatic calls

Through this connected system and dedicated sensors, the Highway Authorities are able to receive data and information relating to traffic safety and road maintenance.

There will also be "Green Islands" along "smart roads" for renewable energy generation and transformation (solar panels, small wind turbines). These will make road infrastructure self-sufficient in terms of power, through an electric energy distribution system that maximises energy efficiency and output ensuring management costs are kept low.

Charging columns have been installed at these sites for those who drive electric vehicles, which are becoming increasingly widespread.

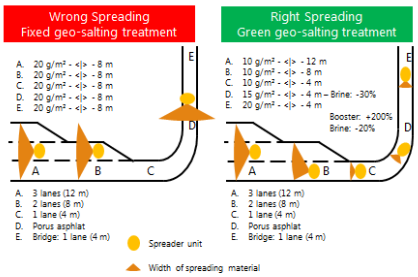
b. Why professional vehicles should interact with the Smart Road?

In this context, the vehicles and equipment used for Winter Road Maintenance must also feature an innovative management system and be able to interact with road infrastructure directly and in real time, exchanging important information regarding road conditions, that may be useful to other WRM vehicles and all end users

Professional services and equipment have a strongly need of know what's going on along the road.

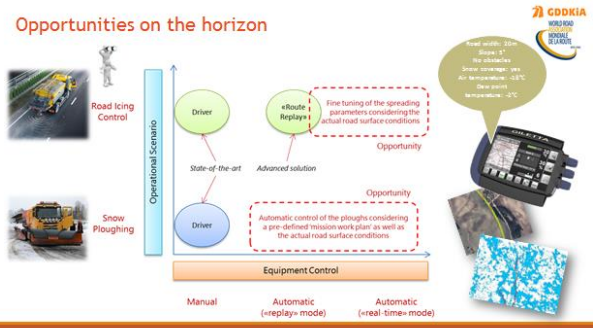
b. The vehicles – Operational scenario

b. The vehicles – Operational scenario

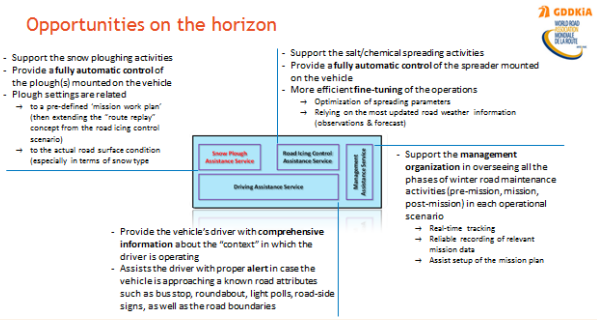


The project is based on the parameterisation of all factors that can affect winter maintenance operations, from the geometry and morphology of the road, to local weather conditions or forecasts, allowing the planning of missions able to define the best solutions and operations, taking every aspect into account.

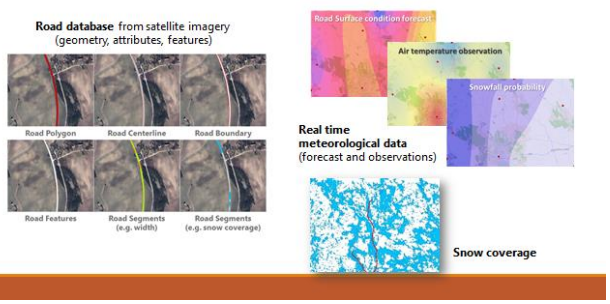
Opportunities on the horizon



Opportunities on the horizon



b. The vehicles – Operational scenario



b. The vehicles – Operational scenario

ASSIST TOWARD SMART ROAD

On board the vehicle, a microprocessor-based control system is able to use a map engine as a navigator and enables positioning of the vehicle via GPS.
During the creation of a digital map, satellite earth observation allows users to view potential obstacles and dangerous points.

ASSIST TOWARD SMART ROAD

In the case of viaducts carrying roads, the presence of expansion joints poses a real problem during snow fall as the shock with cutting edge causes the snow plough to malfunction and the driver can do nothing because the joints are hidden under the snow.

The joints also require heavy maintenance during springtime. ASSIST knows where the joints are positioned, automatically lifting the plough when required, maintaining contact without applying too much pressure, avoiding dangerous shocks and protecting both the plough and the joints.

ASSIST TOWARD SMART ROAD

On board the vehicle, a microprocessor-based control system is able to use a map engine as a navigator and enables positioning of the vehicle via GPS.
During the creation of a digital map, satellite earth observation allows users to view potential obstacles and dangerous points.

In addition, the sensor system installed along the "smart road" and the weather forecast system, exchanges further real-time information with the vehicle. This information is essential to allow better management of operations and ensure traffic safety.
The ASSIST project fits perfectly into the smart road project of intelligent management of unscrambling and represents a significant step forward in improving the quality of work carried out by road maintenance personnel. The ASSIST project can be viewed at the Bucher Municipal stand.

Presentation Ibolya Bali

Road Users' expectations and opinions: a survey concerning winter road service in Hungary

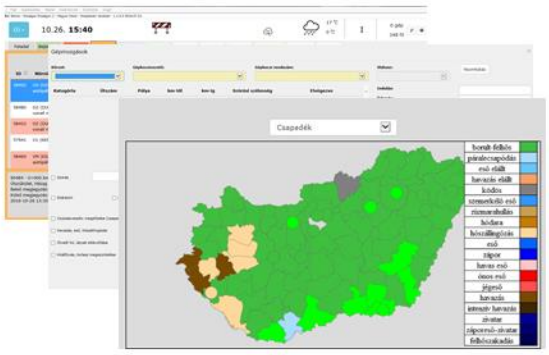
22 February 2018; GDANSK

Ibolya Bali
Traffic Information Services, head of department
Hungarian Public Road Nonprofit Pte Ltd Co.

Road network managed by the Hungarian Public Road Co.

Information flow

Dispatch system



What do we expect from road users?

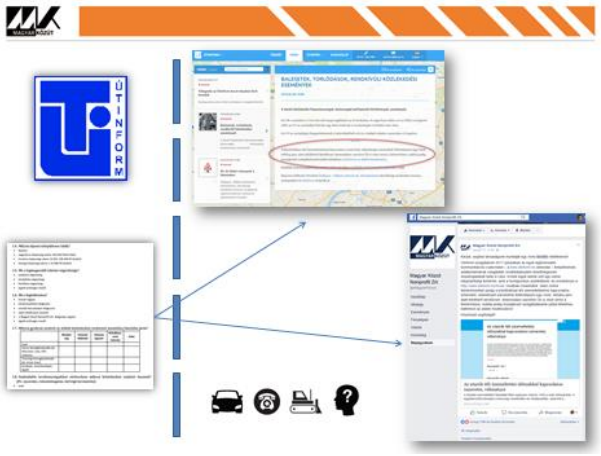
In case of extreme weather conditions please ask yourself the following questions:

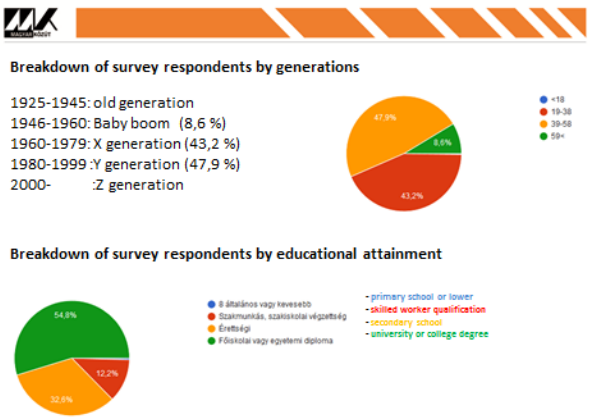
- Is the journey absolutely necessary?
- Have I taken into consideration the national weather forecasts?
- Have I taken into consideration the national and local traffic information?
- Is my vehicle fully tanked?
- Can I count on enough time for the journey?
- Do I carry enough warm drink, food, warm clothing, boots, blade, traction cable, snow chain?

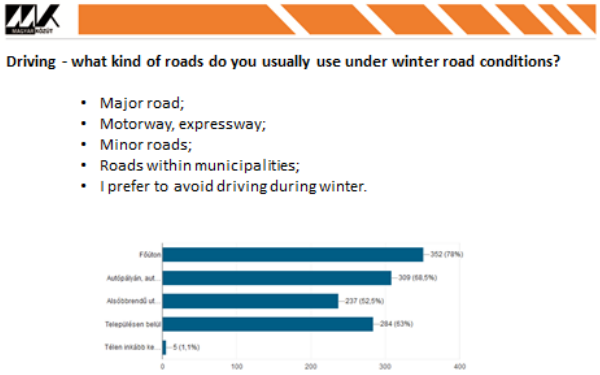
Instructions to follow on the way:

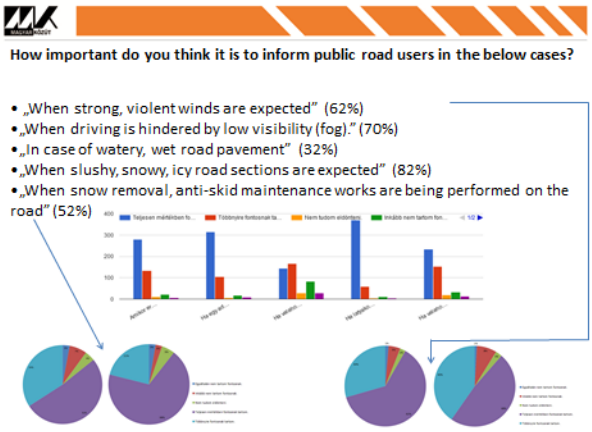
- Do not hinder the winter service vehicles when performing winter road maintenance works (and do not even get close to them)
- In case of trouble, do not leave your vehicle, remain at the scene and wait until help arrives

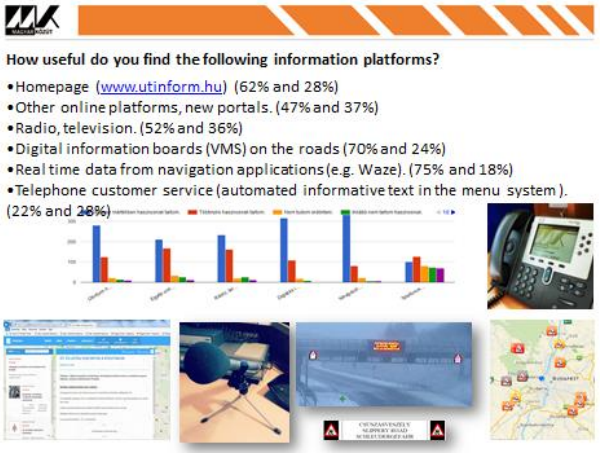
What do road users expect from road operators?

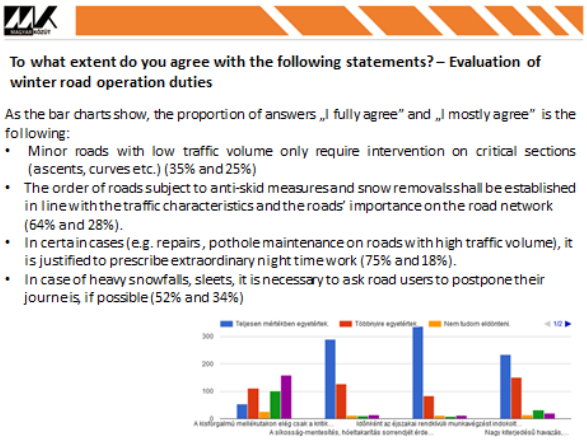



Breakdown of survey respondents by generations
1925-1945: old generation
1946-1960: Baby boom (8,6 %)
1960-1979: X generation (43,2 %)
1980-1999 :Y generation (47,9 %)
2000- :Z generation
47,9%
8,6%
43,2%
<18
19-38
39-58
59<
Breakdown of survey respondents by educational attainment
54,8%
12,2%
32,6%
8 általános vagy kevesebb
Szakmunkás, szakiskolai végzettség
Érettségi
Főiskolai vagy egyetemi diploma
- primary school or lower
- skilled worker qualification
- secondary school
- university or college degree


Driving - what kind of roads do you usually use under winter road conditions?
• Major road;
• Motorway, expressway;
• Minor roads;
• Roads within municipalities;
• I prefer to avoid driving during winter.
Főúton
Autópályán, aut.
Alsóbbrendű ut.
Településen belül
Télen inkább ke...
352 (78%)
309 (68,5%)
237 (52,5%)
284 (63%)
5 (1,1%)
0
100
200
300
400


How important do you think it is to inform public road users in the below cases?
• „When strong, violent winds are expected" (62%)
• „When driving is hindered by low visibility (fog)." (70%)
• „In case of watery, wet road pavement" (32%)
• „When slushy, snowy, icy road sections are expected" (82%)
• „When snow removal, anti-skid maintenance works are being performed on the road" (52%)

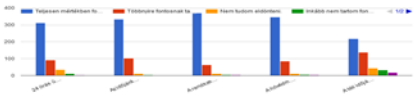

How useful do you find the following information platforms?
• Homepage (www.utinform.hu) (62% and 28%)
• Other online platforms, new portals. (47% and 37%)
• Radio, television. (52% and 36%)
• Digital information boards (VMS) on the roads (70% and 24%)
• Real time data from navigation applications (e.g. Waze). (75% and 18%)
• Telephone customer service (automated informative text in the menu system). (22% and 28%)


To what extent do you agree with the following statements? – Evaluation of winter road operation duties
As the bar charts show, the proportion of answers „I fully agree" and „I mostly agree" is the following:
• Minor roads with low traffic volume only require intervention on critical sections (ascents, curves etc.) (35% and 25%)
• The order of roads subject to anti-skid measures and snow removals shall be established in line with the traffic characteristics and the roads' importance on the road network (64% and 28%).
• In certain cases (e.g. repairs, pothole maintenance on roads with high traffic volume), it is justified to prescribe extraordinary night time work (75% and 18%).
• In case of heavy snowfalls, sleets, it is necessary to ask road users to postpone their journeis, if possible (52% and 34%)

How important do you think the following activities are during the winter service period?

As the bar chart shows, the proportion of answers „I consider it absolutely important" and „I consider it largely important" is the following:

- 24/7 on-duty service at each maintenance center. (69% and 20%)
- placement of snow barriers before the winter service period (placement of snow guard grids, tree planting). (74% and 22%)
- Collect and systemize information on weather and road condition and subsequent measures (82% and 14%).
- Regular preventive maintenance (before incoming snowfall, preventive road salting in case of risk of icy roads (77% and 19%)
- Impose weight restriction or road closure due to winter weather conditions (48% and 31%)



Conclusions, results

Based on the results of the survey, service development is recommended in the following areas in Hungary:

- Develop a mobile application similar to the navigation tool
- VMS: publication of speed and meteorological data in combination with the traffic control
- Development of information published on the website: new map layers, audio file
- establish new cooperations, make the information available to a wider public
- For radio channels: send automatic message news
- IVR: development involving replaceable menu items
- Amendments to laws relating to road operations and interventions
- Consider night work, concept development

THANK YOU FOR YOUR ATTENTION!

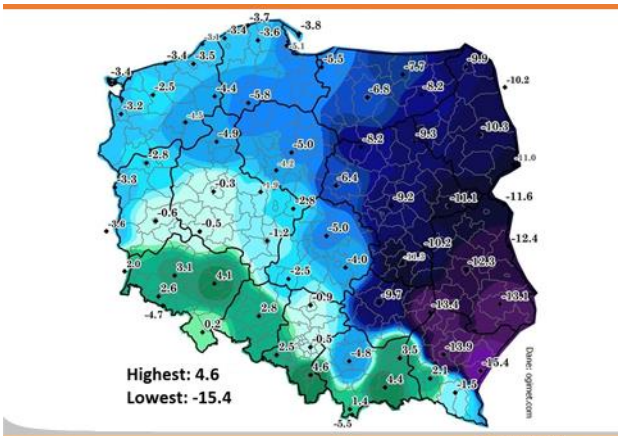
Presentation Andrzej Kabzinski and Piotr Chalka

Generalna Dyrekcja
Dróg Krajowych i Autostrad (**GDDKiA**)
Oddział w Warszawie

General Directorate
for National Roads and Motorways
Warsaw Branch

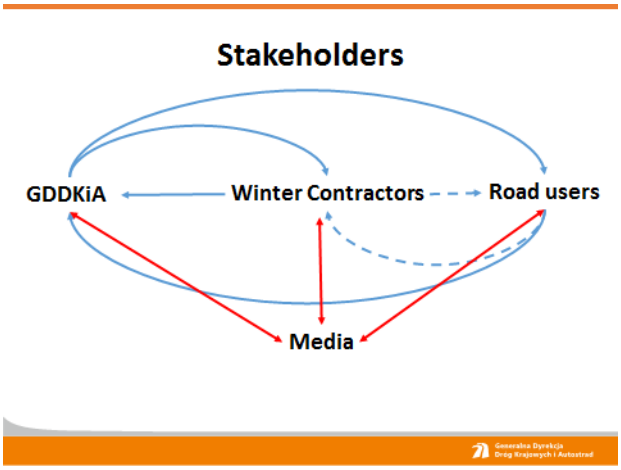
Agenda

- Winter maintenance of roads in Poland
- Communication in winter maintenance of roads
- Methods and forms of communication in GDDKiA



Types of contracts

- Mixed Model
  - performance based
  - applicable to specific road
- Areal/Linear Model
  - pre and after labour measurement based
  - area applicable (multiple roads)
- Quasi-Standard Model
  - performance based
  - area applicable (multiple roads)


Stakeholders
GDDKiA
Winter Contractors
Road users
Media


Why communication is important?
• Coordination of winter maintenance services

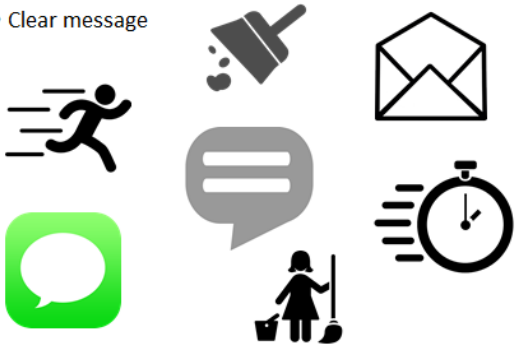

Why communication is important?
• Safety
CAUTION
ICY CONDITIONS
MAY EXIST

Why communication is important?

- Comfort of traveling

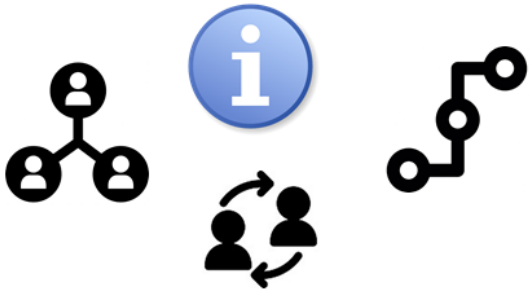
What correct communication consists of?

- Clear message



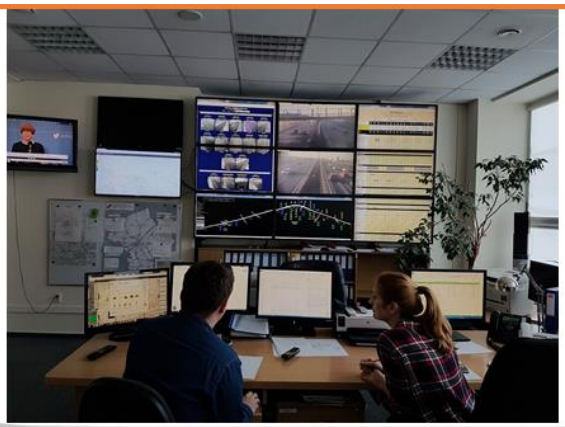
What correct communication consists of?

- Good information



Communication in GDDKiA

- Punkt Informacji Drogowej PID ✓
- Road Information Point RIP ✗



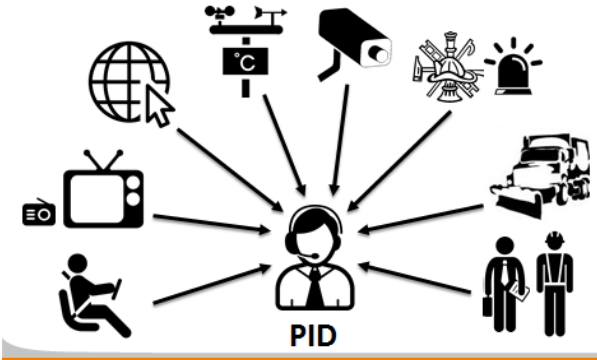
GDDKiA

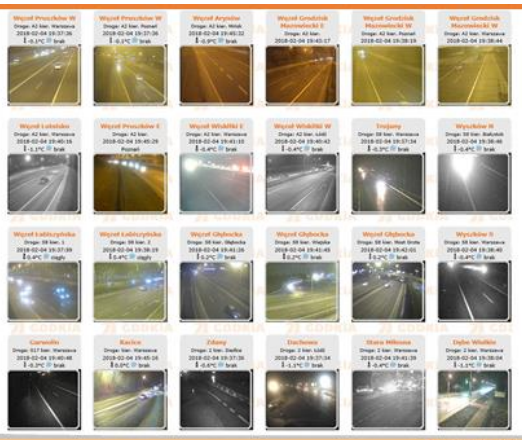
INFORMACJA DROGOWA

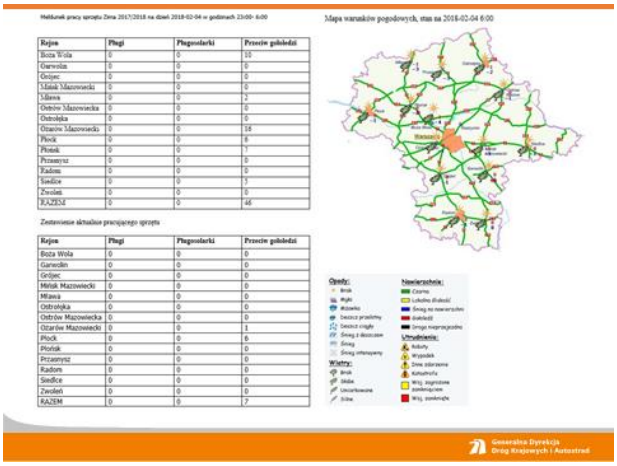
19 111

24/7

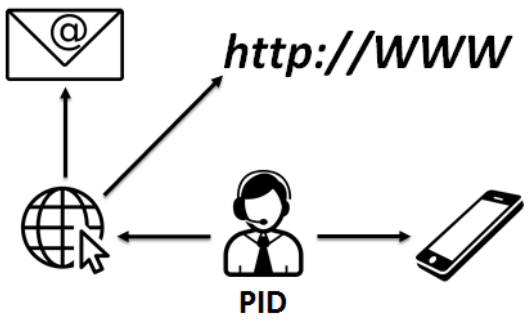
Sources of information



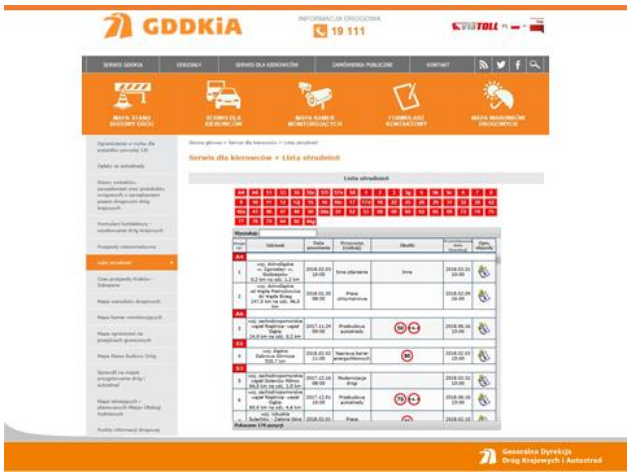




Forms of communication

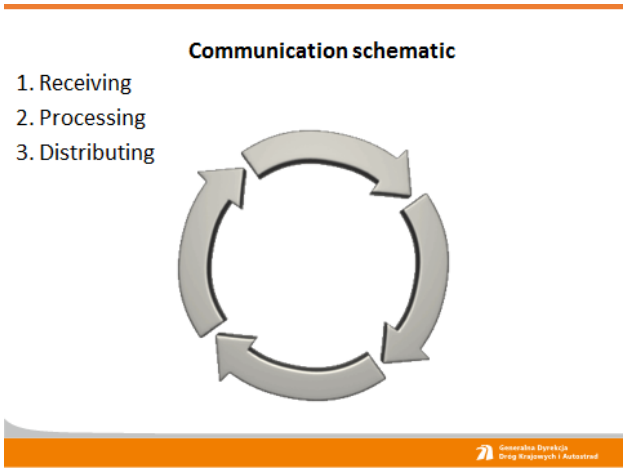


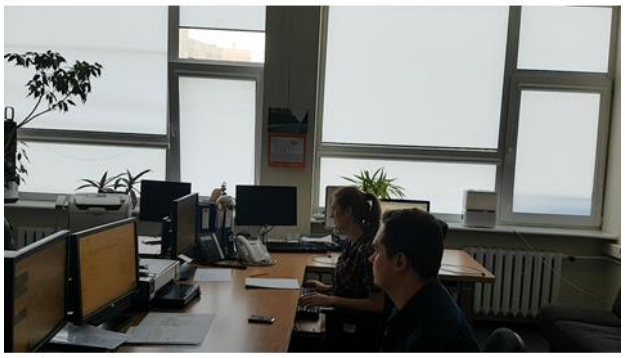

GDDKiA
INFORMACJA DROGOWA
19 111
Serwis dla kierowców • Mapa warunków drogowych
Mapa warunków drogowych

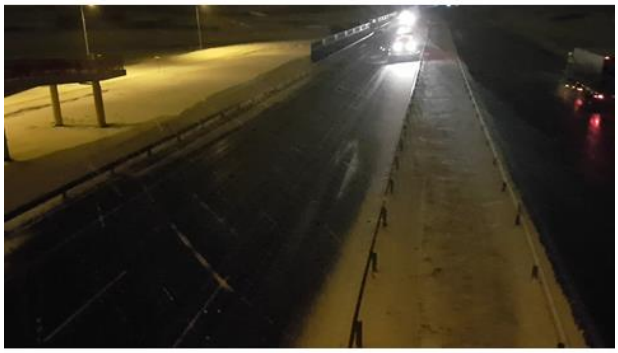

GDDKiA
INFORMACJA DROGOWA
19 111
Serwis dla kierowców • Lista utrudnień


A2 OTWARTA
DO GRODZISKA MAZ


ZA 2.5 KM


Communication schematic
1. Receiving
2. Processing
3. Distributing



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02-808 Warszawa
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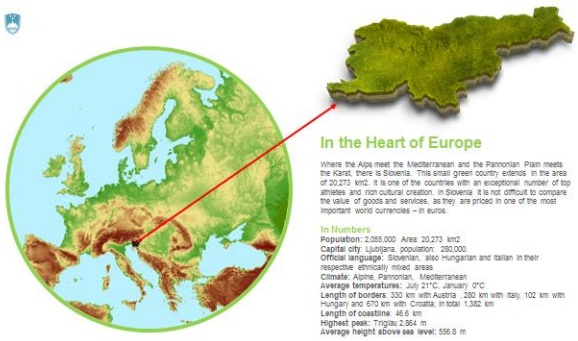
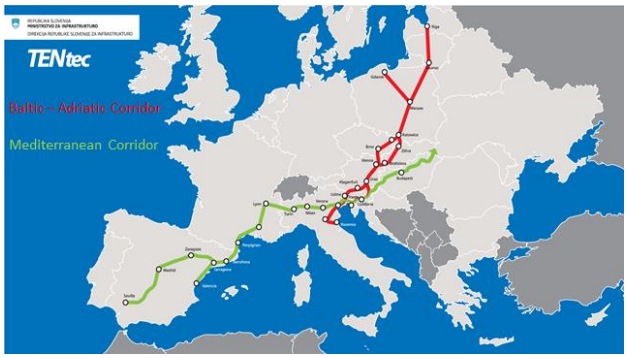
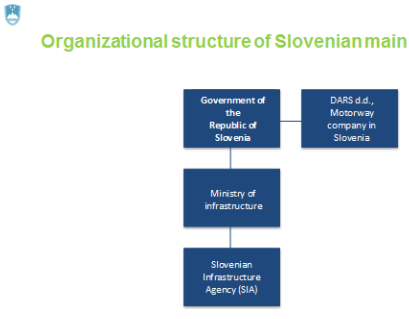
e-mail: sekretariat.warszawa@gddkia.gov.pl
www. gddkia.gov.pl
www.facebook.com
www.twitter.com/gddkia

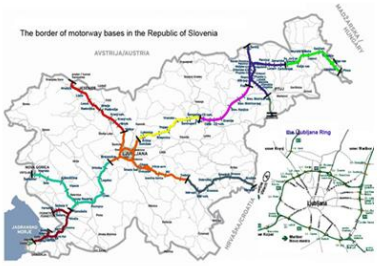
Presentation Uroš Brumec





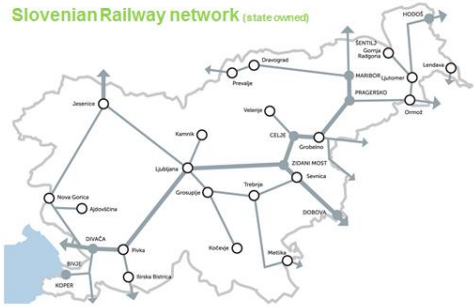


Slovenian Motorway network
(under the jurisdiction of DARS d.d. company)

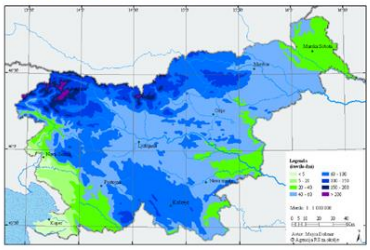


Slovenian Road network
(under the jurisdiction of Slovenian Infrastructure Agency)

Slovenian Railway network (state owned)



Spatial distribution of the duration of the snow cover for the period 1971-2000



Winter Maintenence in Slovenia

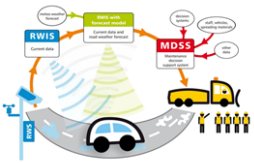
Regular and winter management and maintenance of state roads in the Republic of Slovenia is organized as a mandatory public service of special importance for which the head responsibility lies in the Government of the Republic of Slovenia. Legal framework for that basically consists of three main legal acts:

Public law about roads (Zakon o cestah) which represents the basis for all subsequent legal acts in the field of road management, maintenance and safety
Rule on the types of maintenance works on public roads and on the level of regular maintenance of public roads (Pravilnik o vrstah vzdrževalnih del na javnih cestih in o ravneh rednega vzdrževanja javnih cest) which includes among other things also the prescribed norms
Regulation on the implementation of public service of state roads maintenance (Uredba o načinu izvajanja gospodarske javne službe vzdrževanja državnih cest)

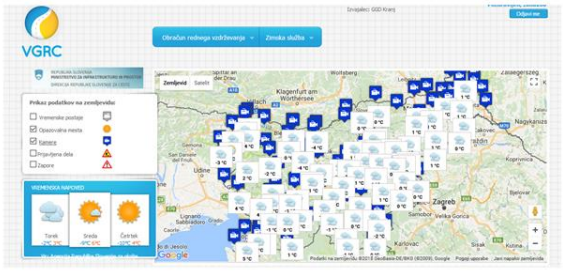
Financial resources for management, maintenance and safety of state roads are provided from the State budget of the Republic of Slovenia, the control over which is annually carried out by Court of Audit of the Republic of Slovenia.

Road weather information system

In Slovenia on main and regional roads there are 24 known problematic road sections, the causes of which are their configuration and location (steep slopes, shadowy location, bora wind, sudden icing...). To better monitor the condition of critical road sections in winter period, more video cameras and weather stations are connected into Road Weather Information System (RWIS). The system incorporates current and past data from road weather stations, detailed previews with charts, alarms (via web application, SMS and e-mail), previews of weather stations equipment and its condition, system administration, data exchange, modelling of road weather forecasts (road surface temperature and condition), etc. Currently there are 68 road-weather stations on Slovenian motorways and expressways and 20 road-weather stations on main and regional roads.

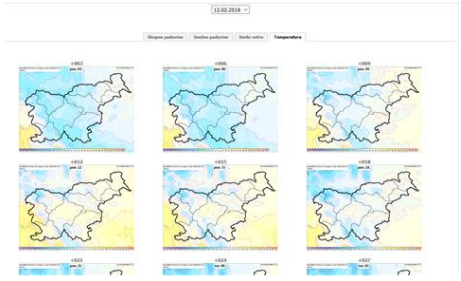


Info / weather portal for state roads

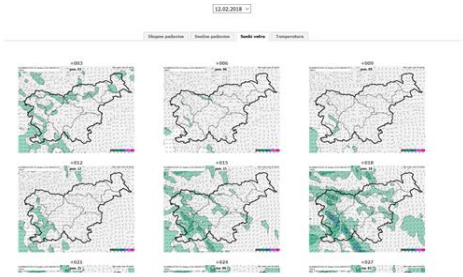


Detaled weather forecast (in words)

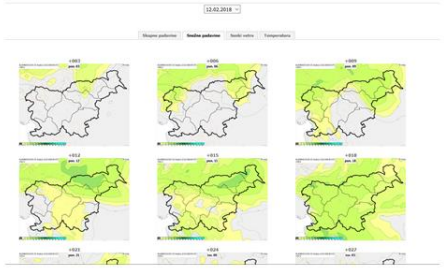
Detaled weather forecast (temperature)



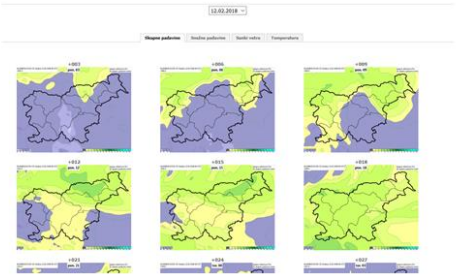
Detaled weather forecast (wind)



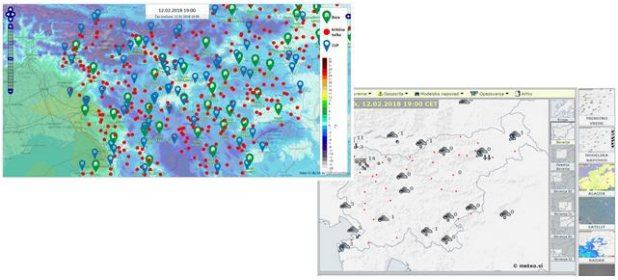
Detaled weather forecast (snow)



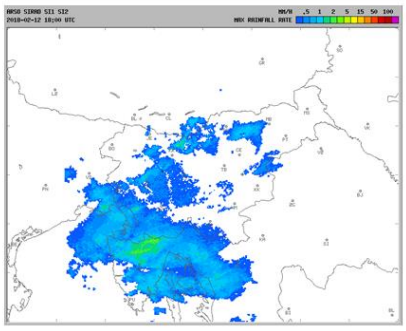
Detaled weather forecast (precipitation – rain, snow)



Links to Slovenian Environment Agency (double check)



Radar picture



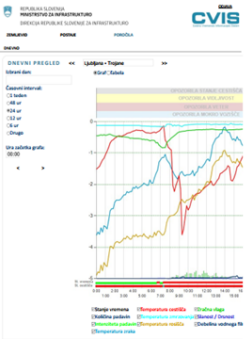
Life streeming – video & data (temperature, wind, moisture, precipitation)

Weather stations – video, temperature (air, road surface, ground, saltiness…)

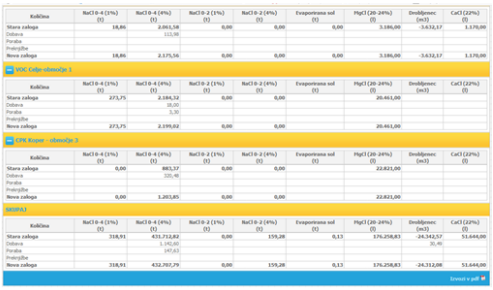
Life streeming – video

Weather stations for predicting (ice, black snow, frost) and monitoring of saltiness on the road surface

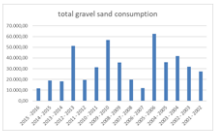
.pdf reports of weather conditions and witer service maintenance
(for supervision, police, court...)

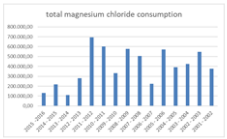


Stock of salt and other material including delivery dates...



Consumed material per season





Heavy traffic and jams (collapse), because of disregards of self-removal of heavy goods vehicles (required by law)

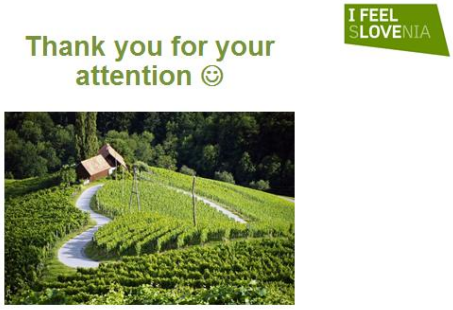
Where road and rail meet

In majority snow ploughs clean roads at level crossings.
Trains are too fast so there is a threat for pedestrians at level crossing to be hit by rocks mixed with snow or ice petches flying around. So in these cases snow has to be cleaned manually.

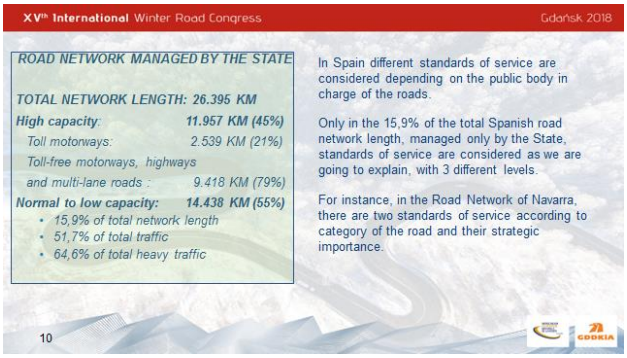
Future challenges for better and more sustainable mobility

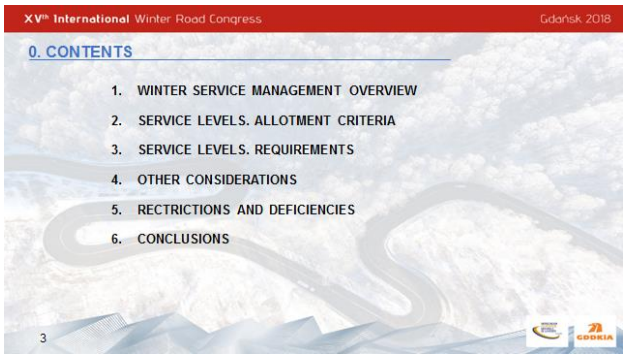
In majority the emphasize / public demand is on roads (cleaning them for cars), but slowly within urban mobility plans and promotion of walking and cycling the cleaning of pedestrian and cycling infrastructure is on the rise...

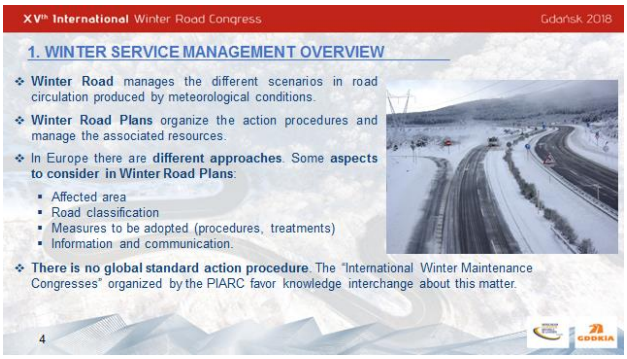

Public information – Traffic Information Centre
PIC
TRAFFIC INFORMATION CENTRE
+386 1 518 8 518
DarsTraffic+
MY PIC
RSS
TWITTER
MOBILE SITE
SLOVENŠČINA
TRAFFIC CONDITIONS
FREIGHT TRAFFIC
NEWS
SINGLE POINT OF ACCESS
Traffic conditions
Street cameras
Traffic counters
Traffic forecast
Wind measuring system Burja
Times to travel
Traffic report
Major border crossings with HR

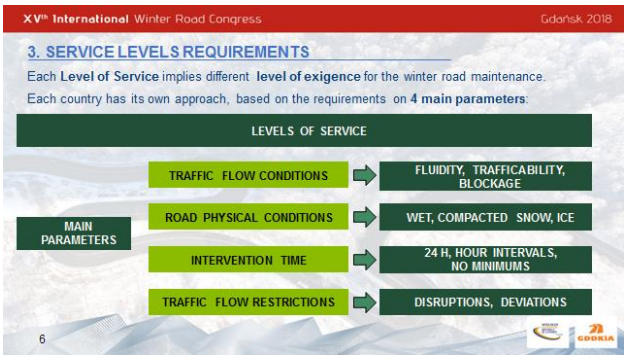

Thank you for your attention ☺
I FEEL SLOVENIA

Presentation Luis Azcue Rodriguez









From a theoretical standpoint the best would be…

TO CONSIDER ALL 4 PERSPECTIVES IN A SINGLE CRITERION

… so as to interrelate the 4 perspectives, in a way that there is a correlation between:

- Level of trafficability.
- Physical conditions of the road in order to achieve that level.
- Time needed to achieve that condition.
- Schedule to be considered so the traffic restrictions are compatible with the type of road considered.

COUNTRIES WITH ADVERSE CLIMATOLOGY

↓

CONSIDER A HIGHER NUMBER OF PERSPECTIVES

7

STRATEGIC CONSIDERATIONS ON STANDARDS OF SERVICE

Having a good definition of the standards of service is key for any winter maintenance plan

↓

Requires that the road managers define different standards of service for each road type

↓

Detailed plan of winter maintenance

8

SPANISH ROADWAY NETWORK (2016)

National Network Length	NATIONAL ROADWAYS NETWORK (RCE)	Autonomous Regions Roadways Network	Provincial Govnmt & Municipal Councils Network
165.483	26.395	71.291	67.797

Units: Kilometers

9

ROAD NETWORK MANAGED BY THE STATE

TOTAL NETWORK LENGTH: 26.395 KM

High capacity: 11.957 KM (45%)
Toll motorways: 2.539 KM (21%)
Toll-free motorways, highways and multi-lane roads : 9.418 KM (79%)

Normal to low capacity: 14.438 KM (55%)
- *15,9% of total network length*
- *51,7% of total traffic*
- *64,6% of total heavy traffic*

In Spain different standards of service are considered depending on the public body in charge of the roads.

Only in the 15,9% of the total Spanish road network length, managed only by the State, standards of service are considered as we are going to explain, with 3 different levels.

For instance, in the Road Network of Navarra, there are two standards of service according to category of the road and their strategic importance.

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Standards of service (Spanish Roadway Network)

- Concerning the Spanish Roadway Network, according to la **Nota de Servicio de la Dirección General de Carreteras de octubre de 2006, three Standards of Service** have been established, considering the two following parameters.

  - **MAXIMUM NUMBER OF DISRUPTIONS** allowed due to snow and ice
  - **MAXIMUM LENGTH OF PERTURBATIONS** on trafficability as a consequence of the metereological phenomenon

NOTA: The presence of ice is not admitted for any of the Standards of Service

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- The disruptions considered are:

  - **"Disruption in heavy vehicles traffic flow"**, as a mean to avoid the crossing of these vehicles in the road.
  - **"Use of snow chains for light vehicles"** to increase the traction of vehicles in conditions of low grip due to the presence of snow or ice.
  - **"Total disruption in the traffic flow of vehicles",** no crossed vehicles but the large amount of snow does not allow the movement of any vehicle.
  - **"Road blocking",** traffic flow is not possible due to the presence of vehicles on the road, usually crossed heavy vehicles and trapped groups of light vehicles.

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SERVICE LEVEL 1

- All toll-free **motorways and expressways**
- **Conventional roads with and ADT of 5000 vehicles and over,** with the exception of mountain passes possessing alternative routes by motorway or expressways, assigned SL2;
- **Access routes to major skiing resorts**
- **All provincial capitals and towns with a population of over 20000** through which one of the State-run Network roads runs must be connected to the main road nework (assigned Service Level 1) by at least one SL1 road;
- Both for this service level and the next, SL2, an attempt will be made to provide the same service level on all road sections along the same route so that the level of service does not vary from origin to destination

SERVICE LEVEL 2

- **Conventional roads with and ADT ranging from 1000 to 5000 vehicles**
- **All access routes to capitals and towns with a population of over 20000 are assigned at least SL2;**
- All **towns with a population of over 4000** through which a state-run Network road runs must be connected to a the main-road network (assigned Service Level 1) or to the secondary network (assigned Service Level 2) by **at least one SL2 road**

SERVICE LEVEL 3

- **The remaining conventional roads, except for mountain passes bridging two provinces or comprising the only link between towns with a population of over 2000 (which must be assigned at least SL2)**

TRAFFIC DISRUPTIONS

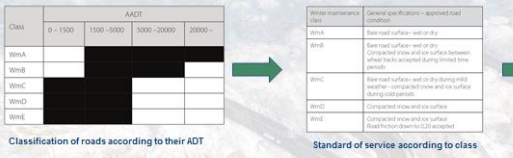
(desirable maximum annual values)

STANDARD OF SERVICE	Phenomenon	Restrictions to Heavy Vehicles		Snow chains for Light Vehicles		Restrictions to all Vehicles		Road-blockings		Clearing of road margins
		No.	Duration	No.	Duration	No.	Duration	No.	Duration	Time
SS-1	Snow	sn.	t + 2 hours	sn.	t + 2 hours	0	—	0	—	t + 6 hours
	Ice	0	—	0	—	0	—	0	—	
SS-2	Snow	sn.	t + 4 hours	sn.	t + 4 hours	1/year	t + 4 hours	1/year	t + 4 hours	t + 1 day
	Ice	0	—	0	—	0	—	0	—	
SS-3	Snow	sn.	—	sn.	—	sn.	—	sn.	—	—
	Ice	0	—	0	—	0	—	0	—	

in, indeterminate
t, duration of the meteorological phenomenon

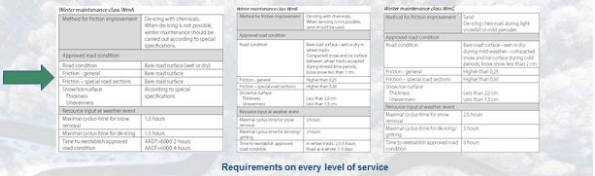
NORWAY:

Applies a methodology integrating the 4 aspects in its plans of winter maintenance.



Classification of roads according to their ADT

Standard of service according to class



Requirements on every level of service

This planning considers specifically for each standard:
- Physical conditions of the road
- Actuation times
- Time for service reestablishment

It also considers implicitly the trafficability conditions required for every case.

Each country has its own criteria in accordance with its particular meteorology, economy, environmental management, etc., even adding some additional parameter

(Nordic countries, as is the case with Finland, estimate a minimum friction coefficient needed according to the condition of the road, from dry to wet ice)

Difficulty in unifying the criteria to establish harmonized service standards across Europe.

4. OTHER CONSIDERATIONS

The procedures are quite similar in Europe. Information is organized in different phases:

- Before the winter season, in countries with more extreme climates, informative campaigns invest in:
  - Driving in adverse conditions
  - Vehicle equipment (tyres, chains, etc)
  - Winter maintenance operations
- During the winter time, information is given about:
  - Weather forecast (telephone, radio, TV, teletext, intenet)
  - Road condition (informative panels and before-mentioned means)
  - Trafficability conditions: (law enforcement agents and and before-mentioned means)
  - Restrictions on trafficability

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5. RECTRICTIONS AND DEFICIENCIES

- The standard of service delivered to users near EU borders is not specifically harmonized.
- In the main routes (trans-European net TENT-T) the level of service is similar across all EU countries
- In comparison with other countries, such as Russia and Belorussia, the standard of service will be similar in normal winter conditions but not in extreme conditions
- Presently, there are no political attempts to harmonize the cross border standards of service in the road maintenance, though work is being carried out to meet the needs of commercial traffic

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6. CONCLUSIONS

- **Most countries consider the same parameters of winter serviceability , however their approach and development is varied.**
- **The particular characteristics of each country (climatology, orography, environment, etc.) prevent the existence of uniformity in the parameters of winter road management.**

Great disparity in standards of service both in national and international spheres

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WORK IS BEING CARRIED OUT IN THE FOLLOWING ASPECTS

- **Studies in relation to melting agents for environmental management**
- **Improve procedures and criteria in winter serviceability based upon the experiences of different countries**
- **Studies on different treatment techniques according to the wearing course(concrete, open bituminous mixtures, etc.)**
- **Make progress in the technology apps of traffic management in sensitive areas of winter serviceability, as key part to ease the treatment, management of sections affected by the presence of tunnels and, generally, to avoid prolonged restrictive measures on trafficability**

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PROPOSAL

European Directive on minimum winter mobility requirements in the trans-European road network???

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Thank you for your attention.

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