

International Seminar
"Winter service on roads and other public places"

Winter Service Standards in Austria

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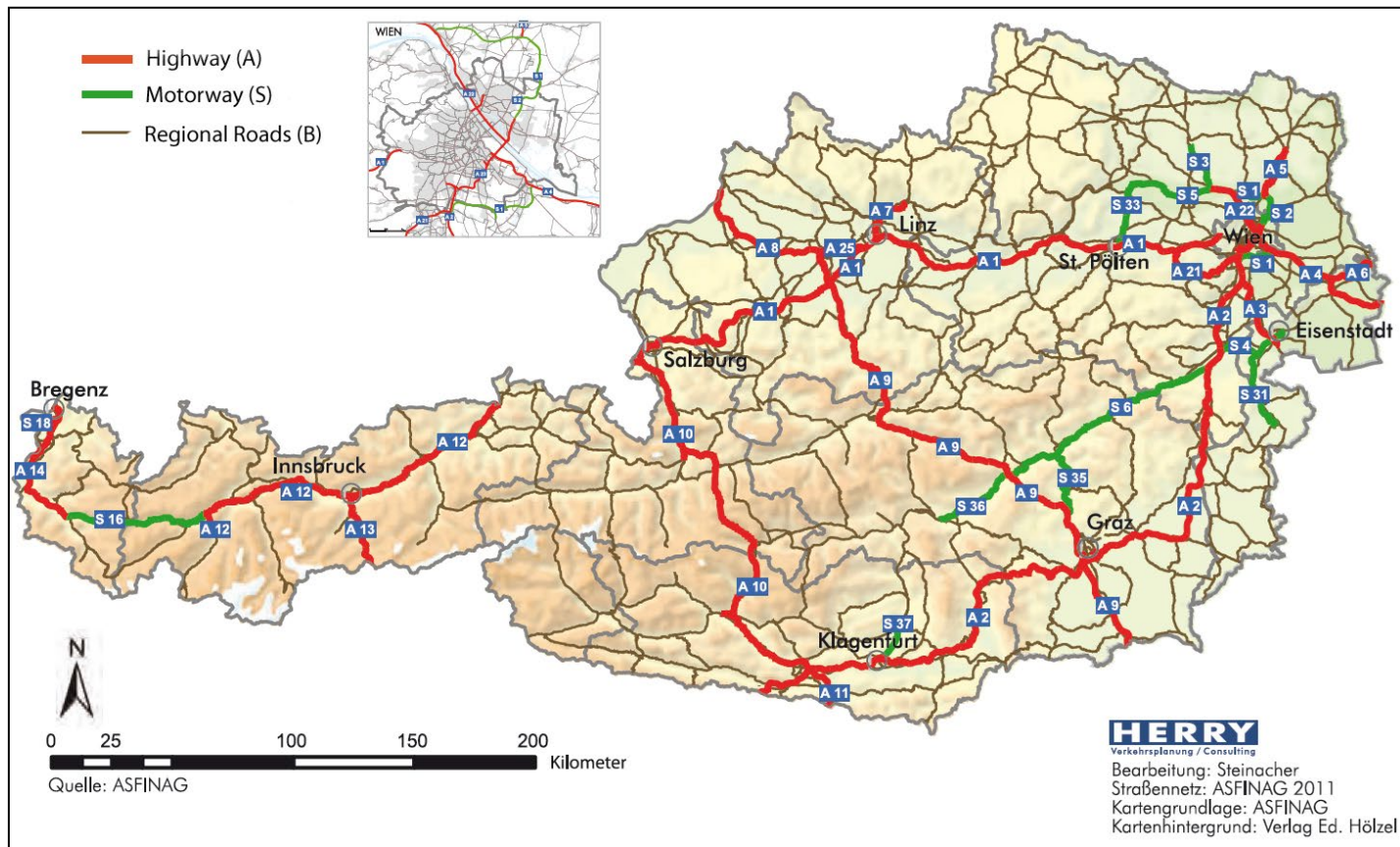
Chair of the
Austrian Winter Service Working Committee

Winter Service Standards in Austria

Presentation content:

1. Legal requirements for winter service
2. Winter maintenance categories in Austria
3. Winter service strategies and developments
4. Austrian Winter Service Research Projects

Winter Service Standards in Austria



Road administration

- Length of the Austrian network: 138.697 km
- Highways and motorways by ASFINAG
- Regional roads by Provincial Governments, cities or municipalities
- Austria has about 240 road service centers

Road network in Austria

Length of the roads

Motorways

2.208 km

Regional main roads

10.344 km

Secondary & country roads

23.681 km

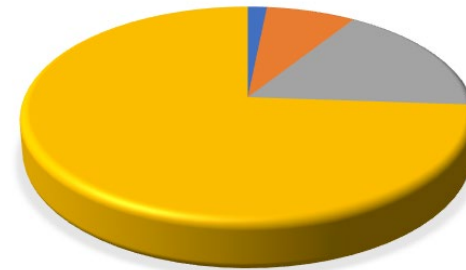
Municipal roads

102.463 km

Network of public roads

138.696 km

LENGTH OF THE ROADS



■ Motorways
■ Regional main roads
■ Secondary & country roads
■ Municipal roads

Salt spreading routes:

Highways and motorways: 100 %

Regional main roads,
Secondary and country roads: 75 %

Gritting routes:

Regional main roads,
Secondary and country roads: 25 %



Organization and operation of winter service

Motorways and federal highways

administrated and operated by the ASFINAG,
a private organization

National Roads

administrated by the Austrian federal states

Municipalities Roads

administrated by the cities or municipalities



Legal requirements for winter service

Legal requirements for roads

ABGB - Austrian General Civil Law

§1319a „Liability of the keeper of the road”

“If a person is injured or something is damaged because of a defective condition of a road, the person who is responsible for the proper condition is liable.”



Legal requirements for winter service

Legal requirements for sidewalks

Road traffic regulations

§ 93 „Duties of the residents “

“In the local area, residents must clear the sidewalk along their houses from 6 a.m. to 10 p.m. and grit it in case of icy conditions.

If there is no sidewalk, the roadside must be cleaned and gritted in the width of 1 m.”



Technical guidelines for winter service

- General and definitions (RVS 12.04.11)
- Snow clearing and gritting (RVS 12.04.12)
- Snow fences (RVS 12.04.13)
- Road Condition Information Systems (RVS 12.04.14)
- Minimization of environmental impacts (RVS 12.04.15)
- Spreading agents (RVS 12.04.16)
- Instruction documents (RVS 14.02.16)
- Snow bars (RVS 05.02.41 und RVS 05.02.4)



Winter maintenance categories on highways and country roads

From the existing legal framework and standards the winter maintenance categories in Austria are:

- On highways, express roads and their junctions the maximum treatment interval (cycle time) is 3 hours in the period between 0h to 24h (**Category A**)
- At high-level country roads with $\text{AADT} > 5.000$ vehicles per day the maximum treatment interval is 5 hours in the period between 4h to 22h (**Category B**)
- At high-level country roads with $\text{AADT} > 1.000$ to 5.000 vehicles per 24 hours at the maximum treatment interval is 5 hours in the period 5h to 20h (**Category C**)
- At low-level country roads with $\text{AADT} < 1.000$ vehicles per day there is no maximum treatment interval in the period between 8h to 20h (**Category D**)



Winter maintenance categories on highways and country roads



Winter maintenance categories on urban areas

Seven priorities (P1 to P7)

- **P1** Inner-city main roads
- **P2** Feeder roads in residential and commercial areas
- **P3** Roads with minor traffic importance, rural character
- **P4** Cycling lanes connecting neighbourhoods
- **P5** Cycling lane as a connection with a local access function
- **P6** Designated sidewalks, pedestrian areas, school routes
- **P7** Parking spaces, parking areas, parkways

Four weather situations

- light snowfall
- heavy snowfall
- long-lasting snowfall
- extreme black ice, freezing rain

Winter maintenance categories on urban areas

Weather condition: Light Snowfalls

	<i>P1</i>	<i>P2</i>	<i>P3</i>
	Inner-city main roads, access roads, roads with bus lines / trams, roads to access public hospitals and fire stations	Roads with minor traffic importance, feeder roads in residential and commercial areas, mountain roads	Roads with minor traffic importance, rural character
Sort of treatment	Ploughing and spreading	Ploughing and spreading	Ploughing and spreading
<i>Service time</i>	4-22	5-22	6-22
<i>Max. snow depth</i>	10 cm	10 cm, more at night	10 cm, more at night
<i>Treatment interval</i>	max. 5 hours	max. 12 hours	max. 12 hours
<i>Treatment with</i>	De-icer favoured	De-icer favoured, if applicable abrasives	Abrasives, de-icer if necessary
<i>Surface condition after treatment</i>	Wet or dry road, slight detractions possible	Wet or dry road, sporadically ice on road possible	Snowy roads and detractions possible

	<i>P4</i>	<i>P5</i>	<i>P6</i>	<i>P7</i>
	Separated cycling lanes connecting neighbourhoods or with significance for commuter traffic	Separated cycling lane as a connection with a local access function or leisure travel	Designated sidewalks, pedestrian areas, school routes, paths in the area of hospitals, stops of public transport within the remit of the local authority	Parking spaces, parking areas, parkways, other trafficked areas
<i>Sort of treatment</i>	Ploughing and spreading	Ploughing and spreading	Ploughing and spreading	Ploughing after other Treatments
<i>Service time</i>	6-19	6-19	6-22	not specified
<i>Max. snow depth</i>	10 cm, more at night	Detractions possible	Detractions possible	Detractions possible
<i>Treatment interval</i>	max. 12 hours	as required	According §93 StVO or §1319a ABGB	none
<i>Treatment with</i>	De-icer favoured, if applicable abrasives	De-icing or abrasive	De-icing or abrasive	De-icing or abrasive
<i>Surface condition after treatment</i>	Dry road, sporadically ice or grit on road possible	Trafficability sporadically ice or grit on road possible	Dry road, sporadically ice or bumps on road possible	According to the possibilities. Restrictions due to snow deposition possible

Austrian Winter Service Research Projects



Research report
**Optimization of prewetted
salt application**
(2011)



Research report
**Suitability criteria of de-
icing agents**
(2015)



Research report
**Impact model spreading,
clearing and residual salt**
(2019)

Preventive treatment

The most effective salting strategy (release coating)

Relative flux



1. Preventive treatment before snowfall event

e.g. 10 g/m^2 on the eve of a snowfall event of 1 cm/h
road surface temperature = -5°C mit treatment interval = 3 h
resulting in 3 cm snow depth per treatment interval



2. Dilution and formation of 2 phases

1. Phase snow/ice above (about 0% salt) density $0,1-0,9 \text{ g/cm}^3$
2. Phase brine below (8% salt) density $1,1 \text{ g/cm}^3$. The applied salt is dissolved gradually, until an equilibrium concentration is reached at 8% and -5°C



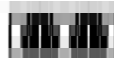
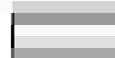
3. Snowploughing and salt application

The brine film prevents adhesion of the snow on the road surface and relieves further snowploughing. For salt application applies: remaining snow + applied salt = brine 8% (salt consumption depends on quality of ploughing and road condition)



4. Thaw residual snow (continue with 2)

Thaw of the remaining snow and brine formation $\geq 8\%$; ongoing development according to 2 until end of snow falls (discharge loss due to traffic and mixing not considered)



Development of the spreaders for higher brine shares

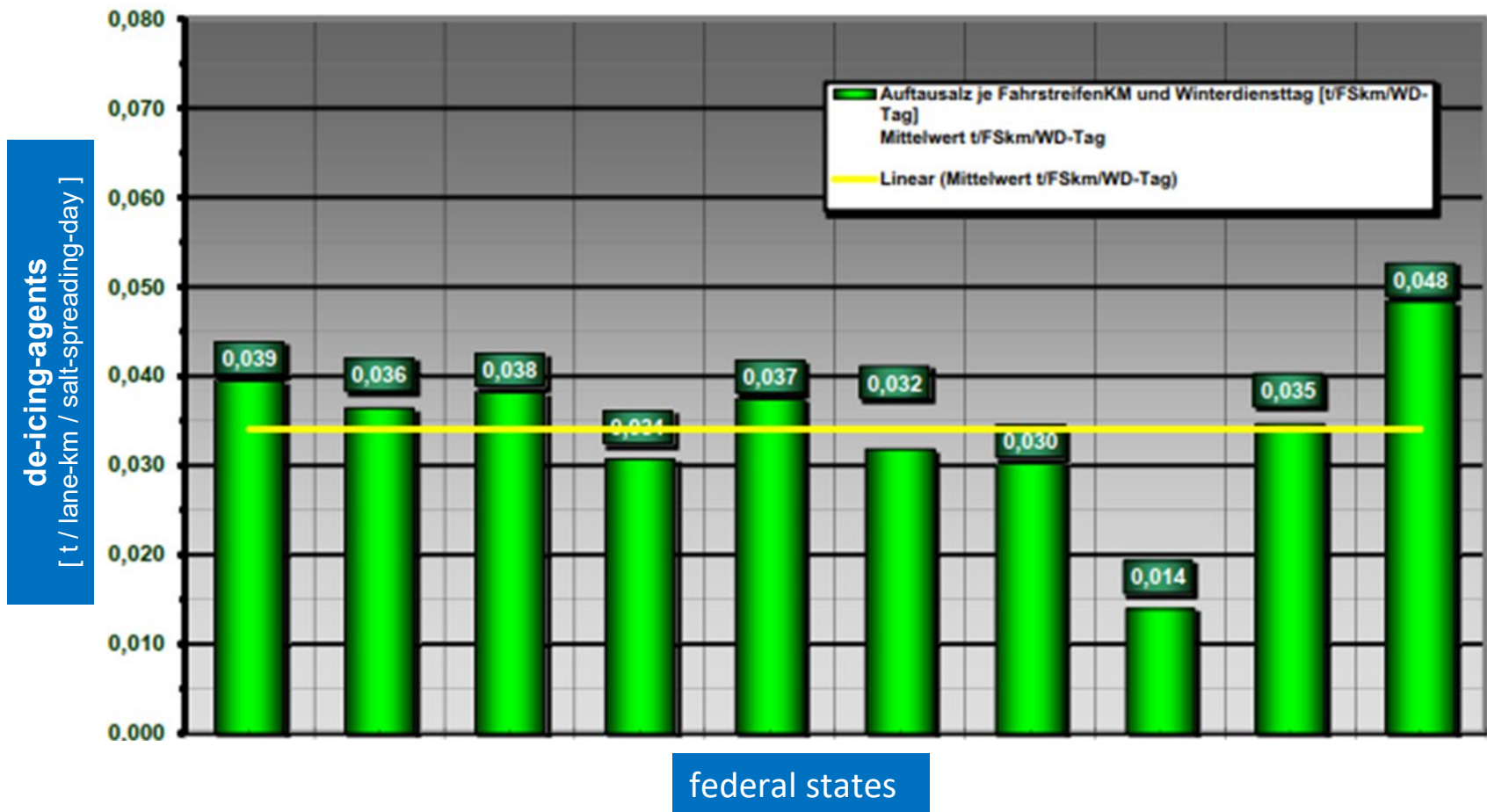
Third action: every new pre-wetted-salt spreader has an additional brine-tank for FS50- and FS70-spreading



Actual status in Lower-Austria: the new spreader generation spreads FS30, FS50, FS70 and FS100 only with the spreading disc; in the photo FS70 is spreaded

Austrian Winter Service Statistics 2020/21

WINTER-SERVICE-PERIOD 2020/21
de-icing-agents per lane-KM and salt-spreading-day
Motorways and Regional Roads





THANK YOU FOR YOUR ATTENTION

Josef Neuhold

Chair of the Austrian Winter Service Working Committee