SOLUTION WINTER AND SUMMER ROUTINE MAINTENANCE OF MOTOWAYS – AUSTRIA

Ministry of Transport, Praha, 20th October 2016
Mario Krmek
ASFINAG Holding
AGENDA

• ASFINAG – Overview
• Operational Tasks – General Overview
• Winter Service
AGENDA

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ASFINAG was founded in 1982 and is 100% owned by the Republic of Austria.

Company Structure

Autobahnen- und Schnellstraßen-Finanzierungs-Aktiengesellschaft

ASFINAG
Bau Management GmbH

ASFINAG
Maut Service GmbH

ASFINAG European Toll Services GmbH

ASFINAG Commercial Services GmbH

Verkehrsauskunft Österreich VAO GmbH

ASFINAG
Service GmbH

ASFINAG Alpenstraßen GmbH

Shares are completely owned by the Republic of Austria.
ASFINAG
General Overview

- **Tasks:** Planning, construction, maintenance, operation, funding and tolling of motorways and expressways in Austria
- **Road network:** In operation: 2,199 km
- **Employees:** 2,742
- **Motorway operation and maintenance facilities:** 43
- **National traffic management center:** 1
- **Regional traffic management centres:** 9
- **Locations:** Wien, Graz, Innsbruck, Salzburg, Ansfelden, Zirl
- **Financing:** Vehicles < 3.5 t: toll stickers + special tolls
  Trucks > 3.5 t: mileage-dependent toll
<table>
<thead>
<tr>
<th>Category</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of network</td>
<td>2,199 km</td>
</tr>
<tr>
<td>Lane kilometres</td>
<td>11,877 km</td>
</tr>
<tr>
<td>Tunnels</td>
<td>164</td>
</tr>
<tr>
<td>Kilometres in tunnels</td>
<td>383</td>
</tr>
<tr>
<td>Bridges</td>
<td>5,192</td>
</tr>
<tr>
<td>Existing noise protection</td>
<td>1,327 km</td>
</tr>
<tr>
<td>(at the roadside and along</td>
<td></td>
</tr>
<tr>
<td>central reservations)</td>
<td></td>
</tr>
<tr>
<td>Total area of noise protection</td>
<td>4.30 km²</td>
</tr>
</tbody>
</table>
ASFINAG
Key Figures II

- Motorway operation and maintenance facilities: 43
- Motorway service stations: 86
- Rest areas: 48
- 18,500 parking spaces for cars and 6,855 for trucks
- Parking areas: 110

Reliability all the way.
ASFINAG
Austrian Motorway and Expressway Network

Toll Roads (Motorways and Expressways)
Version: 2016
Total length of road network: 2,199 km
Agenda

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ASFINAG Service Companies

Strategy

Core Tasks
• Operation of the motorway and expressway network
• Maintenance of the existing infrastructure (roads, bridges, tunnels and other facilities and equipment)
• Traffic management and customer information

Strategic Goals
All activities are geared towards fulfilling ASFINAG’s strategic goals:
• Increasing customer satisfaction
• Ensuring network availability
• Improving traffic safety
• Optimising performance standards and economic efficiency
ASFINAG Service Companies
Operational Tasks

- Operating 2,199 kilometres
- Cleaning rest areas and parking areas
- Snow clearance and gritting services provided 7 days / 24 hours
- “Ordering” refurbishment, upgrading and renewal works
- Cutting of grass, trees and shrubs
- Tunnel cleaning
- Reviewing and checking tunnel safety equipment and facilities
- Tunnel monitoring
- Section monitoring (→ ASFINAG Traffic Management Centre)
- Operation of traffic control systems
- Close cooperation with emergency services (police, Red Cross, etc.)

Reliability all the way.
ASFINAG
Operation and Maintenance/Monitoring Centres

ASFINAG MOTORWAY MAINTENANCE, MONITORING CENTRES

- 43 Motorway maintenance centres
- Monitoring centres
  - Arnding, St. Jakob/Arfberg
  - Bruck/Mur, St. Michael/Lungau
  - Hohenems, Wels
  - Klagenfurt, Wien-Kaisermühlen
  - Plabutsch

- Traffic control centre
  - Wien-Inzersdorf

Reliability all the way.
ASFINAG Service Companies

Key Figures I

Staff (ASG and SG)
• Appr. 1,300 employees

Fleet
• 406 Trucks/Unimogs
• 403 Small trucks
• 443 Cars
• 63 Special vehicles
ASFINAG Service Companies
Key Figures II (2015)

- Total costs
  - thereof personnel expenses: EUR 74.1 million
  - thereof material used for gritting and snow clearance (salt, brine, etc.): EUR 5.8 million
  - thereof energy costs: EUR 1.1 million

- Salt consumption 2015: approx. 62,300 tons
ASFINAG Service Companies
Tasks - Road and Tunnel Cleaning

• Roads, tunnels, drain systems (road surface, drainage, waste water and gully systems, walls, ceilings, etc.) are cleaned at regular intervals
• Special equipment is used to clean tunnels
• All tunnel cleaning activities are coordinated to minimise traffic disruption
• Closing times are optimised by streamlining resources
ASFINAG Service Companies
Tasks - Care and Maintenance of Green Areas

• Cutting grass and weeds around traffic signs, radar boxes and mowing of hard shoulders and central reservations

• Mowing machine convoys are used to minimise the impact on the flow of traffic
ASFINAG Service Companies
Tasks - Winter Service: Gritting and Snow Clearance

• Activities related to gritting and snow clearance services actually start in summer: fixing snow poles, re-filling salt storage halls and adapting duty rosters
• In wintertime 1,200 staff are available for gritting and snow clearance services
• Ongoing monitoring of current and forecasted weather conditions
• Increased control and clearance of sensitive road sections
• Consideration of economic and environmental aspects
ASFINAG Service Companies
Tasks - Other Maintenance Works

• Repair works on small road surface sections, repair of joints and cracks in the road surface
• Maintenance, renewal and cleaning of road-side equipment – including traffic signs, overhead signage, safety barriers and roadside emergency telephones
• Works are usually performed at night when traffic volumes are low (except in cases of imminent danger)
ASFINAG Service Companies
Tasks - Traffic/Tunnel Monitoring

- 9 Monitoring Centres
- Staffed 24 hours/7 days
- Primary tasks:
  - Monitoring of network sections
  - Incident management
  - Monitoring ice warning systems (approx. 300)
  - Support gritting and snow clearance service
- Monitoring, maintaining, operating of electrical equipment (lighting, emergency call facilities, radio installations, etc.)
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Winter Service
Legal Basis

- Liability of operator → Austrian General Civil Law § 1319a
  - ASFINAG is liable for slight negligence
  - Reversed burden of proof

- Service level for winter maintenance → „State of the art“
  - Winter maintenance: 24 hours, 7 days
  - Spreading of thawing materials (not blunting)
    → „black clearance“
  - Turnaround time: max. 3 hours
Winter Service
Definition – “Black” Clearance vs. “White” Clearance

Black clearance:
• Wheel tracks are „black“
• Tyres have direct contact to the road surface
• Spreading of thawing materials (salt, brine)

White clearance:
• Wheel tracks are „white“
• Tyres run on snow
• Scattering of grit

Reliability all the way.
Winter Service
Clearance Strategy

1. Preventive spreading → before snowfall
2. Melting of falling snow (→ brine)
3. Snow removal + spreading
4. Melting of the remaining snow
Winter Service
Tools – Ice Warning Systems

Ice warning systems constantly measure:

• Air temperature
• Road temperature
• Relative humidity
• Dew point temperature

In case of water film on the surface:

• Freezing temperature (depending on residual salt content)
Winter Service
Tools – Weather Forecast Software

Meteogramm ABM Alland
Prognose aktualisiert: 29.10.2013, 11:05

Winter Service
Tools – Real Time Control Software
Winter Service
Snow Removal

• The amount of snow that can be defrostet with salt is limited (approx. 1cm)
• In case of snow: mechanical snow removing is necessary
• Staggered “formation“ of snowplows

ASFINAG’s winter service truck:
• 3-axle truck with appr. 400 HP
• 7 m³ → appr. 8.4t of salt
• Salt spreader
• Front and side plow
  → total clearing width 6.5m
• Working speed: 40-50 kph
Winter Service
Spreading Technology

• State of the art:
  Prewetted salt “FS 30“
  → salt (NaCl) moistened with brine (NaCl or CaCl) in a ratio of 70:30
• Dosing of spreading quantity in preventive scattering:
  5 – 10 g/m²
•Ion scattering during snow shovelling (without brine)
Winter Service
Tasks for the Future

• Improving forecast models
  • Pavement temperature
  • Forecast of hoarfrost

• Reduction of losses in preventive spreading
  • Increasing the brine-salt ratio (FS 50, FS 70, FS 100)
  • Rolling out of combined spreading machines (salt-brine mixing ratio from 0:100 to 100:0)
Winter Service
Operational Key Figures Winter 2014/2015

• Winter service days: 185
• Total distance driven by winter service trucks: 3,427,260 km
• Total operating time: 159,721 hours
• Total salt consumption: 70,332 t
• Total brine consumption: 8.312 million litres
• Average salt consumption per lane-km: 6.14 t/km
• Average brine consumption per lane-km: 725 l/km
• Average proportion of brine: 11%
• Total costs ASFINAG: 36,231 Mio. € (→ 3,147 € per lane-km)
• 92% of caring routes are serviced in less than 120 min (requirement = 180 min)
RELIABILITY ALL THE WAY.