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XIII INTERNATIONAL WINTER ROAD CONGRESS

QUÉBEC, FEBRUARY 8 TO 11, 2010

WORLD ROAD ASSOCIATION
MONDIALE DE LA ROUTE
AIPCR PIARC

Québec

SUSTAINABLE WINTER SERVICE FOR ROAD USERS

ICE CONTROL WITH BRINE SPREAD WITH NOZZLES ON HIGHWAYS

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AIBAN
VINTER SERVICE

TRAFFIC ACCIDENTS ON SLIPPERY ROADS

- Research: In the winters 2007-2009 we used liquid-only *(brine spread with Nozzles and GPS controlled spreading)* on 150 km highway.
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- Results on police reported accident on slippery roads:
- Winter 2005-2006 7 (Traditional salt spreading)
- 2006-2007 5 (Traditional salt spreading)
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- Winter 2007-2008 1 (liquid-only)
- 2008-2009 2 (liquid-only)

DISPOSITION

- **Waste of salt.**
- **Spreading Technology**
- Salt spread with disc (spinner type)
- Brine spread with Nozzles
- GPS and precise spread pattern
- **Implementation**
- Funen 1000 km highway
- North Funen 150 km highway (GPS)
- **Results**
- Accidents before and after new technology

WASTE OF SALT

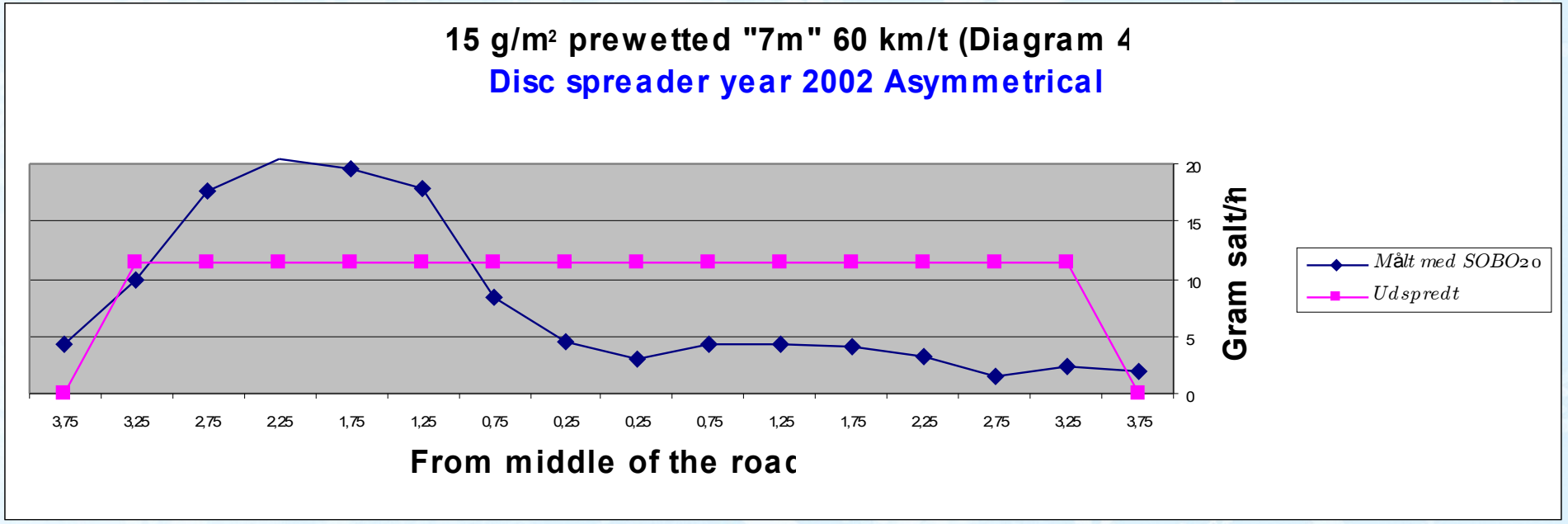
With traditional spreading techniques half of the ice control agent is wasted

It do not have any effect at all except form contributing to the environmental impact.

To reduce the waste one has to focus on the “spreading quality” of the spreaders

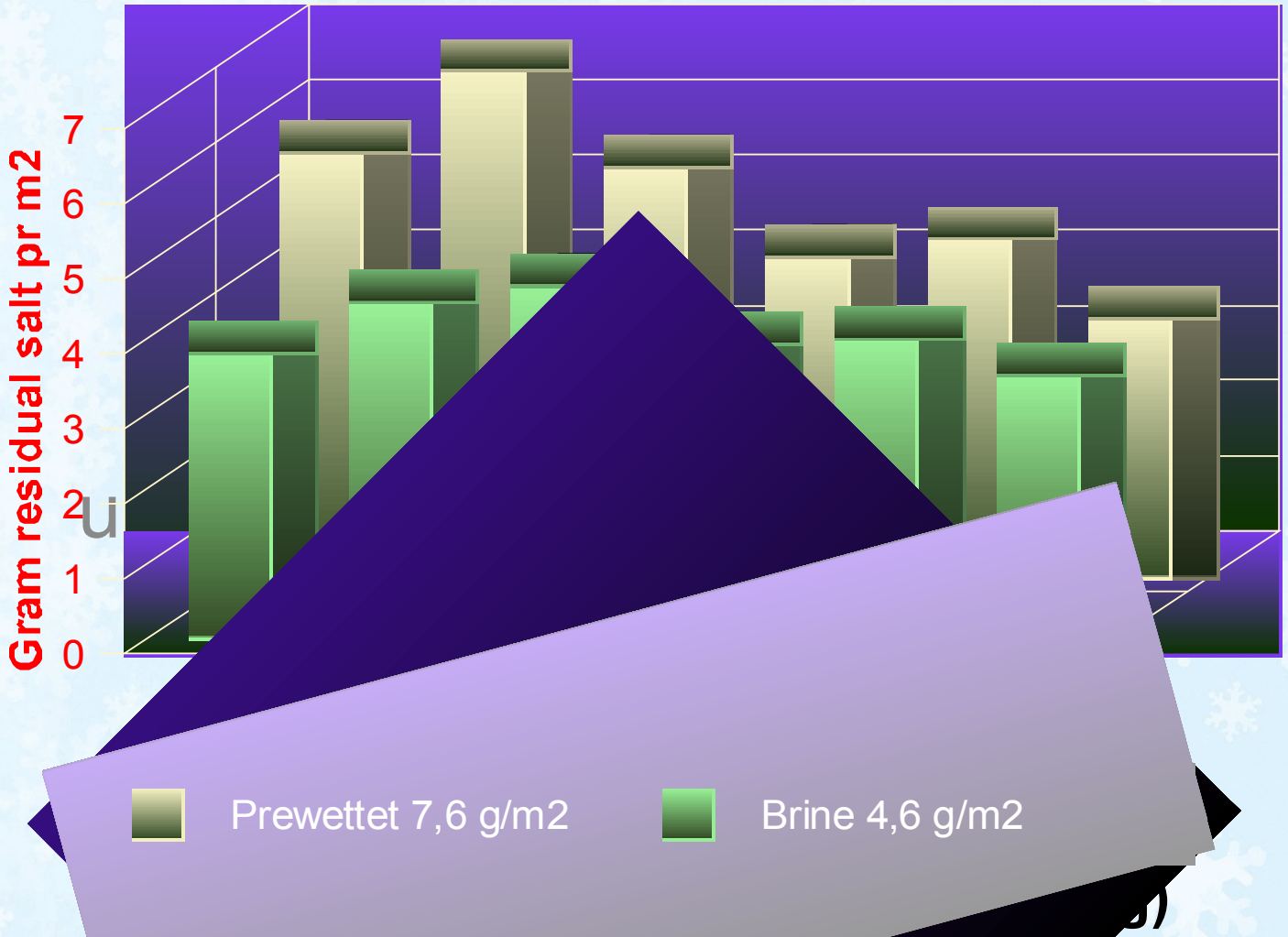
Measurement example
Disc (Spinner type)

This is a bad example,
but there are many of this bad examples



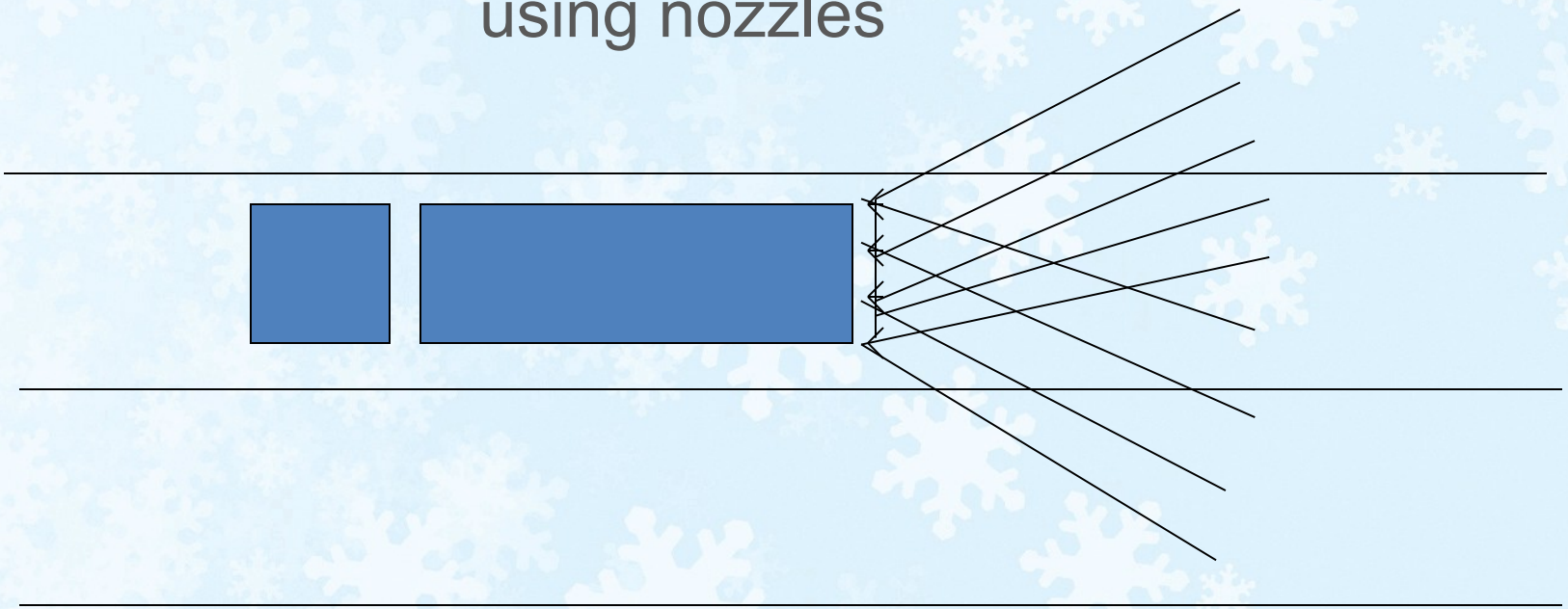
BRINE-PREWETTED

- **Residual salt 2 hours after spreading (1999-2000)**



BRINE

- Spreading princip using nozzles



The nozzles have been optimized to spread a continues thick jet.

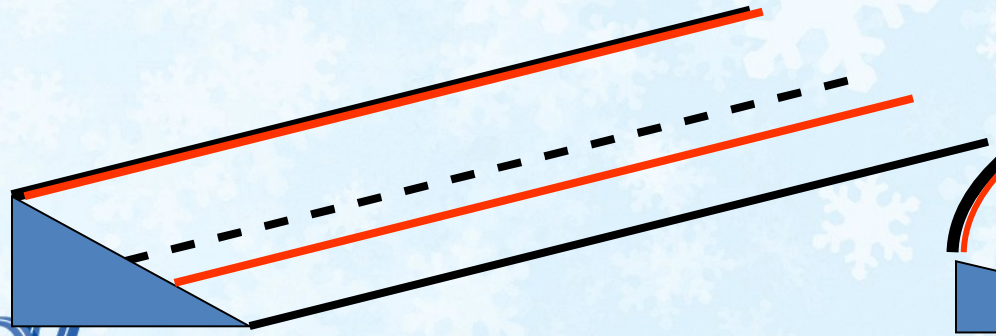
The speed of the jet must be faster than the speed of the wind along the vehicle.

Verifying calibration

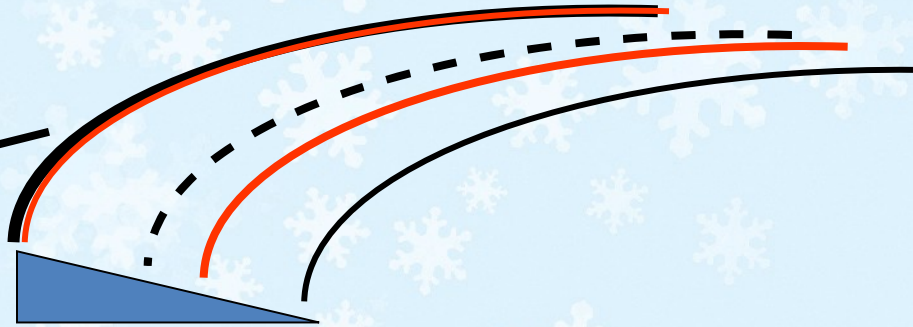
- Distribution is verified by controlling that spreading reaches the marked fields, one for each of the nozzles.
-
- Dosage is verified by tapping liquid from each nozzle into a tub and weighing it.
-
- Simple, but efficient.

•Precise spreading

- ***We can use less brine (salt) with GPS-controlled spreading if we place***
  - ***brine(salt) on the high level on the middle***
  - ***brine(salt) on the high level in curves.***
  - ***less brine(salt) on lane with heavy traffic***



Necessary spreading



Necessary spreading

GPS controlled spreading

- 80 km/hour = 22 m/second. (Nobody can adjust precise)
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- Necessary automatically to adjust width and symmetry.
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- Necessary to know the transversal gradient of the road
-
- Northern Funen Municipality use route navigation, too.

Implementation liquid-only

Winter Road (before 2007)

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- (State: 175 km)
- County of Funen: 1000 km
- (32 municipalities:5600 km)
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- After road administration change 2007

- North Funen Municipality 150 km highway

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Brine - prewetted salt

- ***2002 – 2005 The County of Funen use Brine on some routes and pre-wetted salt on other routes.***
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- ***10 % less accident***

  caused by icy roads,

  when using brine.
- ***A result similar to Colerado***

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GPS and BRINE
Liqued-only

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Statistical

- 1 and 2 or 5 and 7 crashes
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- Statistical it is very few crashes!
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- I am seeking partners, with interest in liquid-only highway routes, to qualify the statistic!

- **Thank you for your attention**
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- Jens Kristian Fonnesbech
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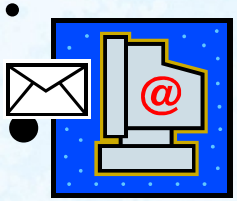
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