

# Lasting of Salt on Rural Roads in Germany

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## 0. CONTENT

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1. Introduction
2. Execution of Measurements
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5. Recommendations

This report is based on parts of the research project carried out at the request of the Federal Ministry for Transport, Building and Urban Development, represented by the Federal Highway Research Institute, under research project No. 04.250/2011KGB.

The author is solely responsible for the content.

## 1. INTRODUCTION


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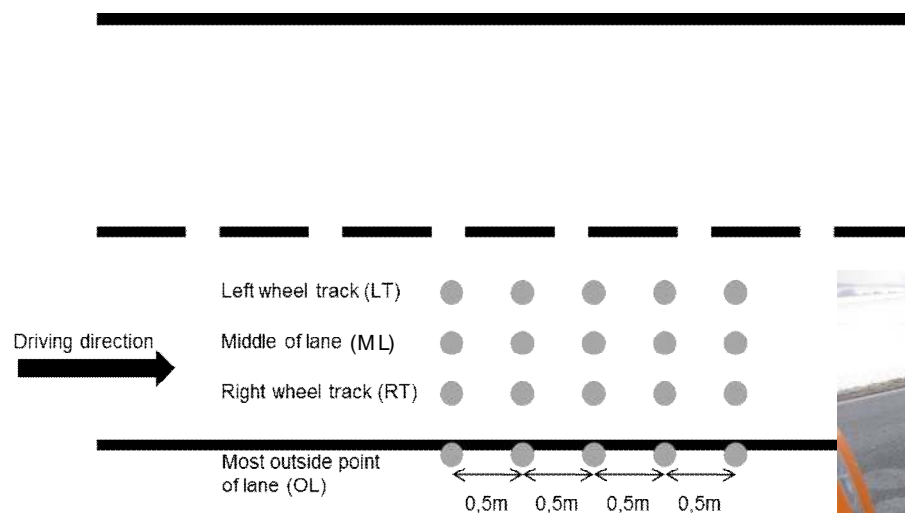
**Distribution and lasting of salt on roads depend on:**

- Traffic volume and composition
- Driven speeds
- Location of road stretch
- Weather conditions / Road surface conditions
- Gradient, crossfall and texture depth
- Type of anti-icing agent
- ...

**Experiences in Germany are available for motorways only!**

## 2. EXECUTION OF MEASUREMENTS

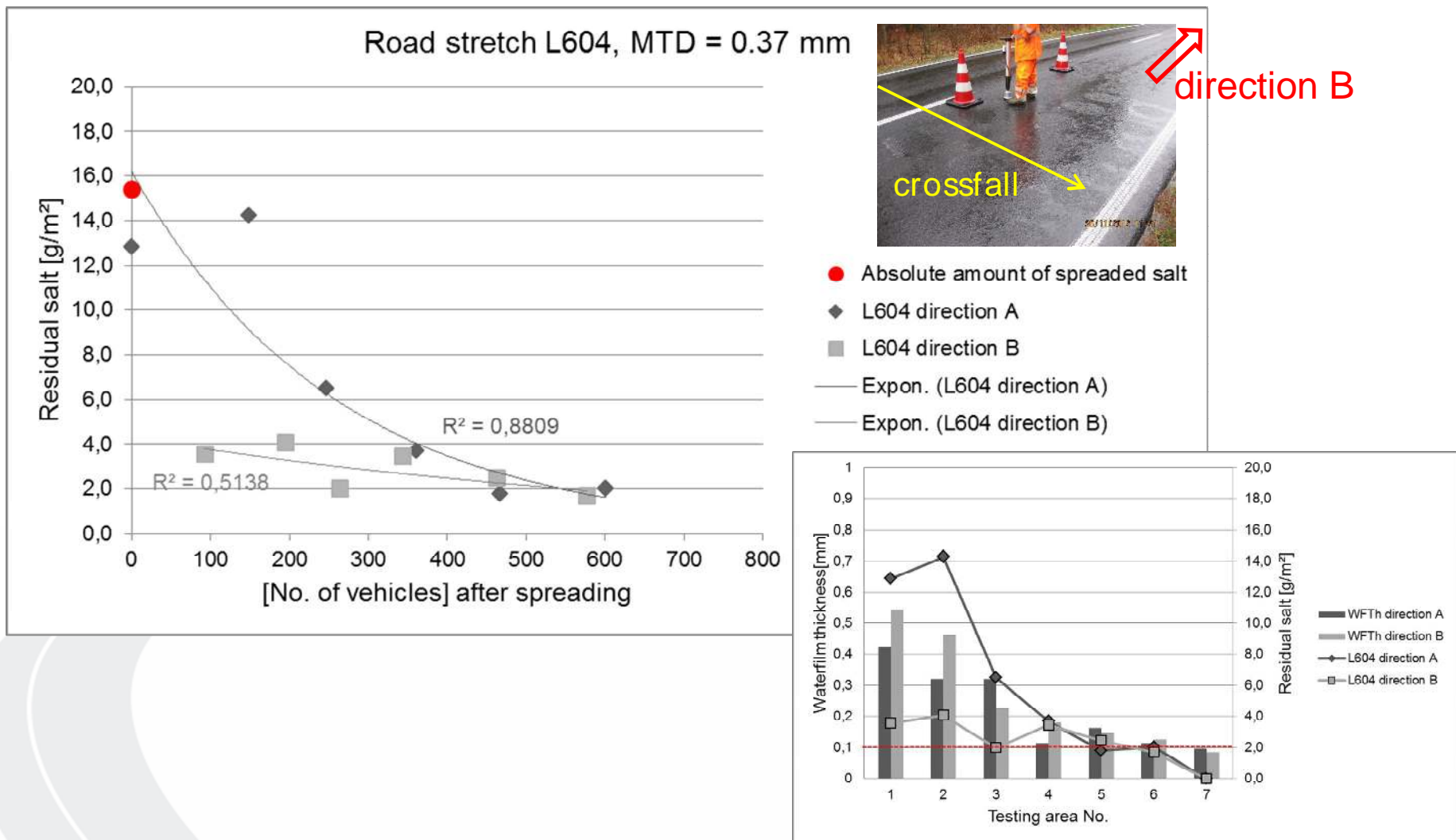
- 13 road stretches in winter 2011/2012 and 2012/2013
- Measuring device: SOBO 20 
- Testing area:



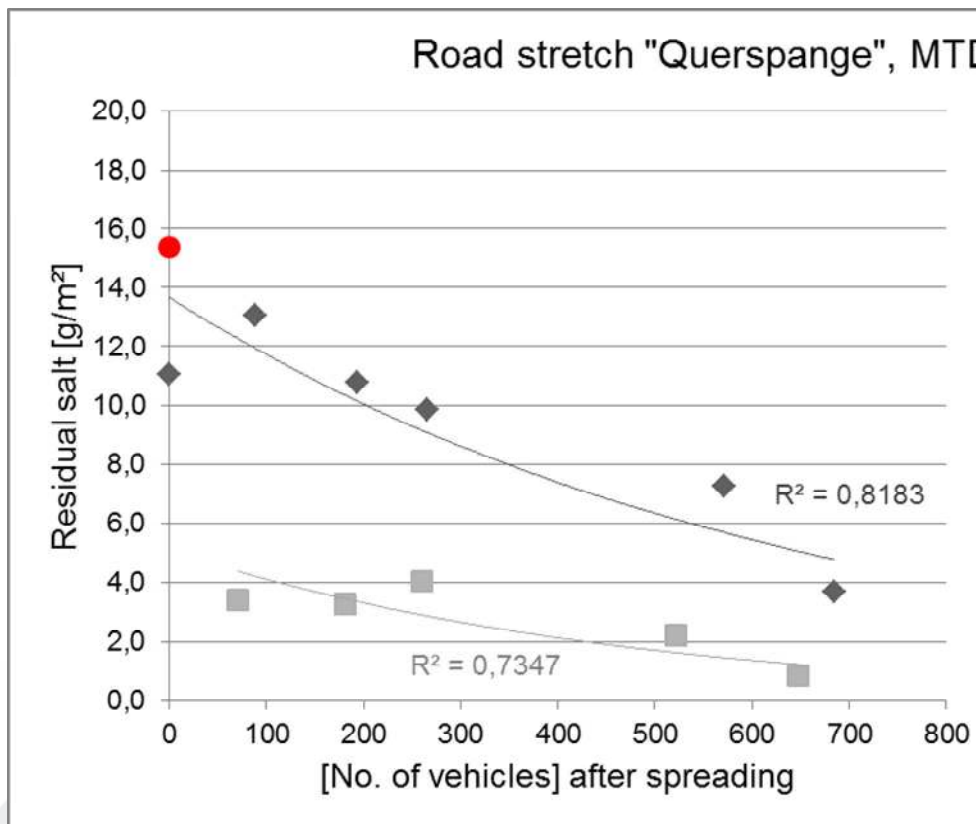
## 2. EXECUTION OF MEASUREMENTS

road stretches	ADT [vehicles/24h]	height above mean sea level	surrounding area of road stretch	Mean Texture Depth [mm]
<b>SM Gernsbach</b>				
L76b RT	1650	360	hillside situation	<b>direction A 1.81; direction B 0.94</b>
L76b KB1	500	850	hillside situation	1.01
L76b KB2	500	900	slope, woodland area	1.02
<b>AfA Karlsruhe</b>				
L604	7500	115	woodland area	0.41
Grabener Strasse	5000	115	exposed area	<b>direction A 0.37; direction B 0.95</b>
Querspange	5000	115	exposed area	0.63
<b>SM Schwaebisch Gmuend</b>				
L1075	3700	420	exposed area	<b>direction A 1.05; direction B 0.75</b>
L1159	2200	560	slope, hillside situation	<b>direction A 0.63; direction B 1.07</b>
L1160	4100	550	exposed area	0.66
<b>SM Wuerzburg</b>				
B19	6000	280	exposed area	0.68
Wu4	3200	350	slope, woodland area	0.63
Wu9a	700	340	exposed area	0.31
Wu9b	700	340	bridge, exposed area	0.70

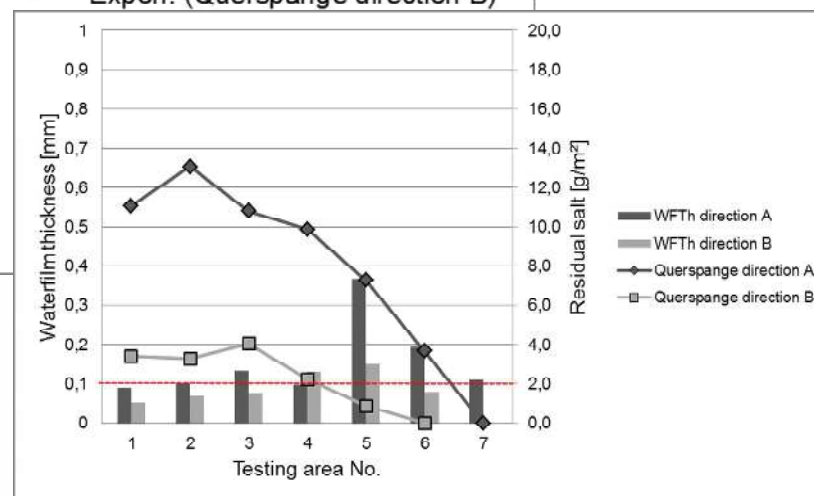
## 2. RESULTS – PREWETTED SALT, wet surface



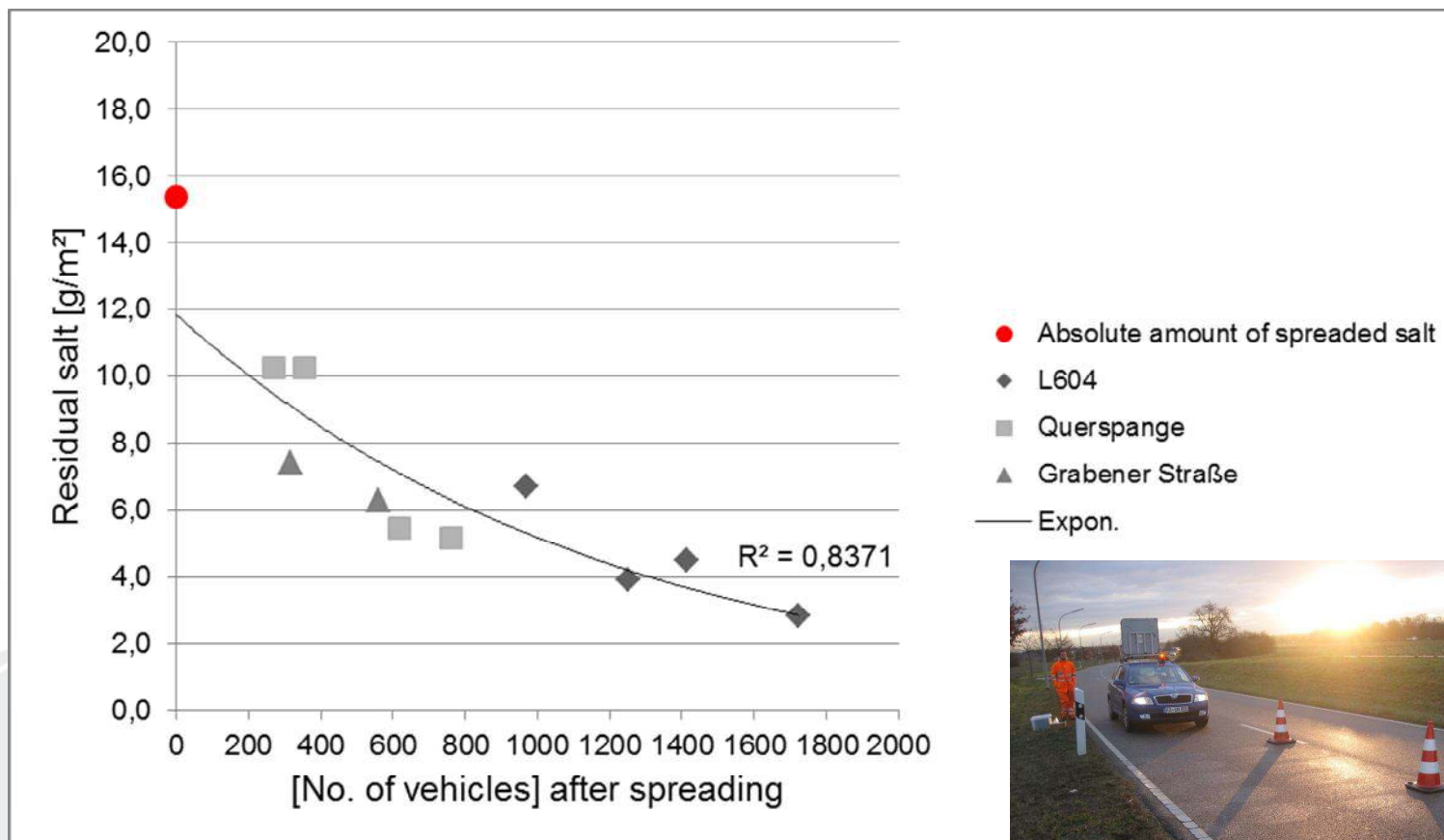
## 2. RESULTS – PREWETTED SALT, moist to wet surface



- Absolute amount of spreaded salt
- ◆ Querspange direction A
- Querspange direction B
- Expon. (Querspange direction A)
- Expon. (Querspange direction B)

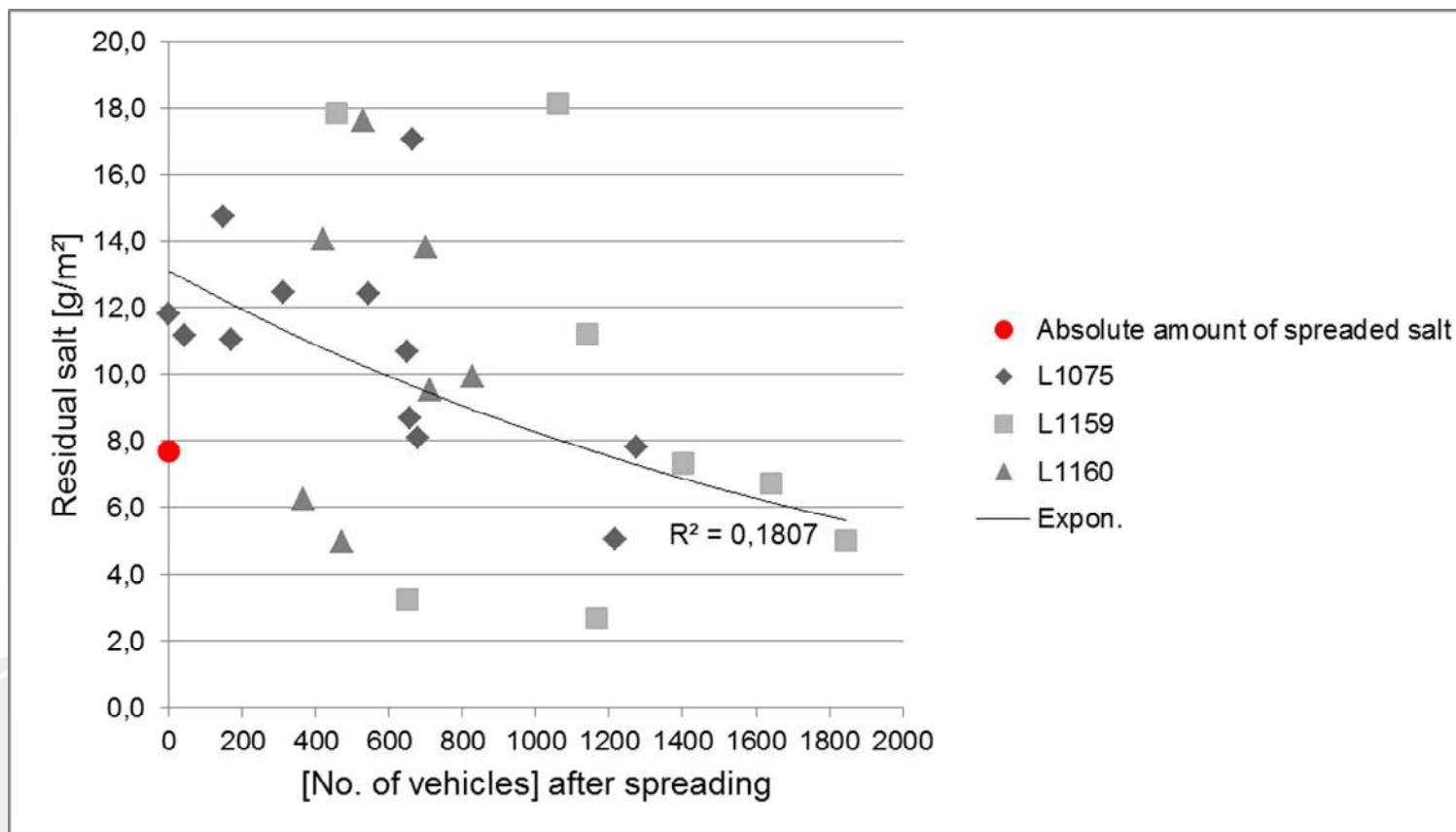


## 2. RESULTS – PREWETTED SALT, moist surface

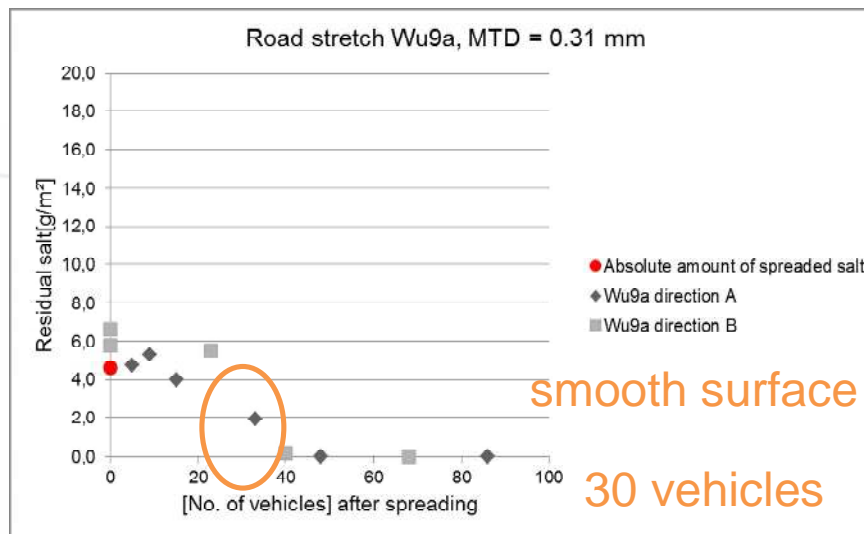
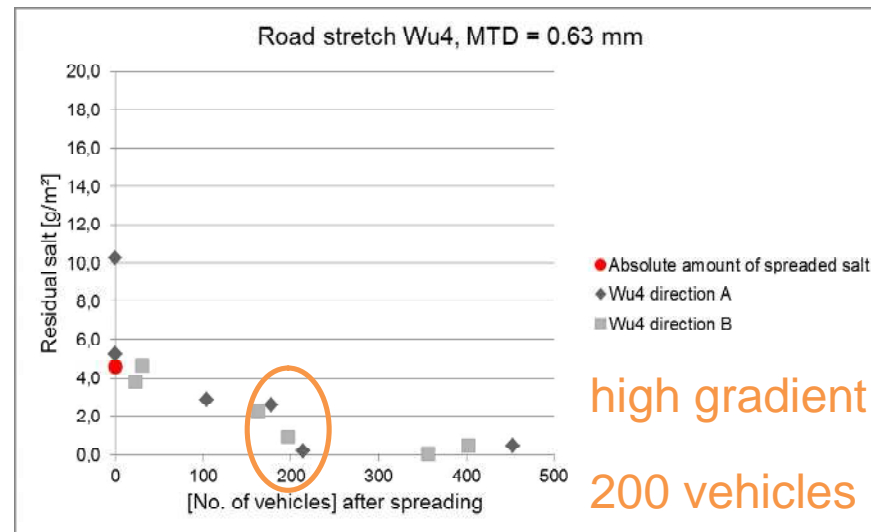
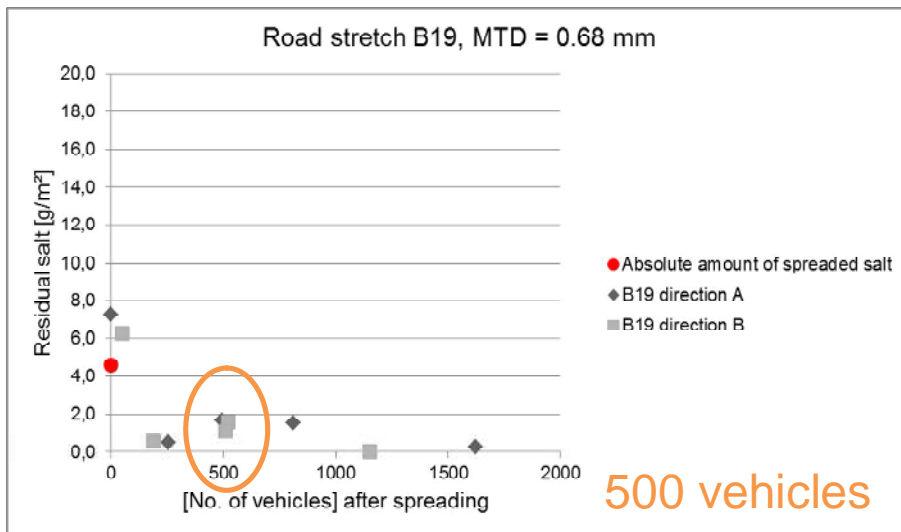




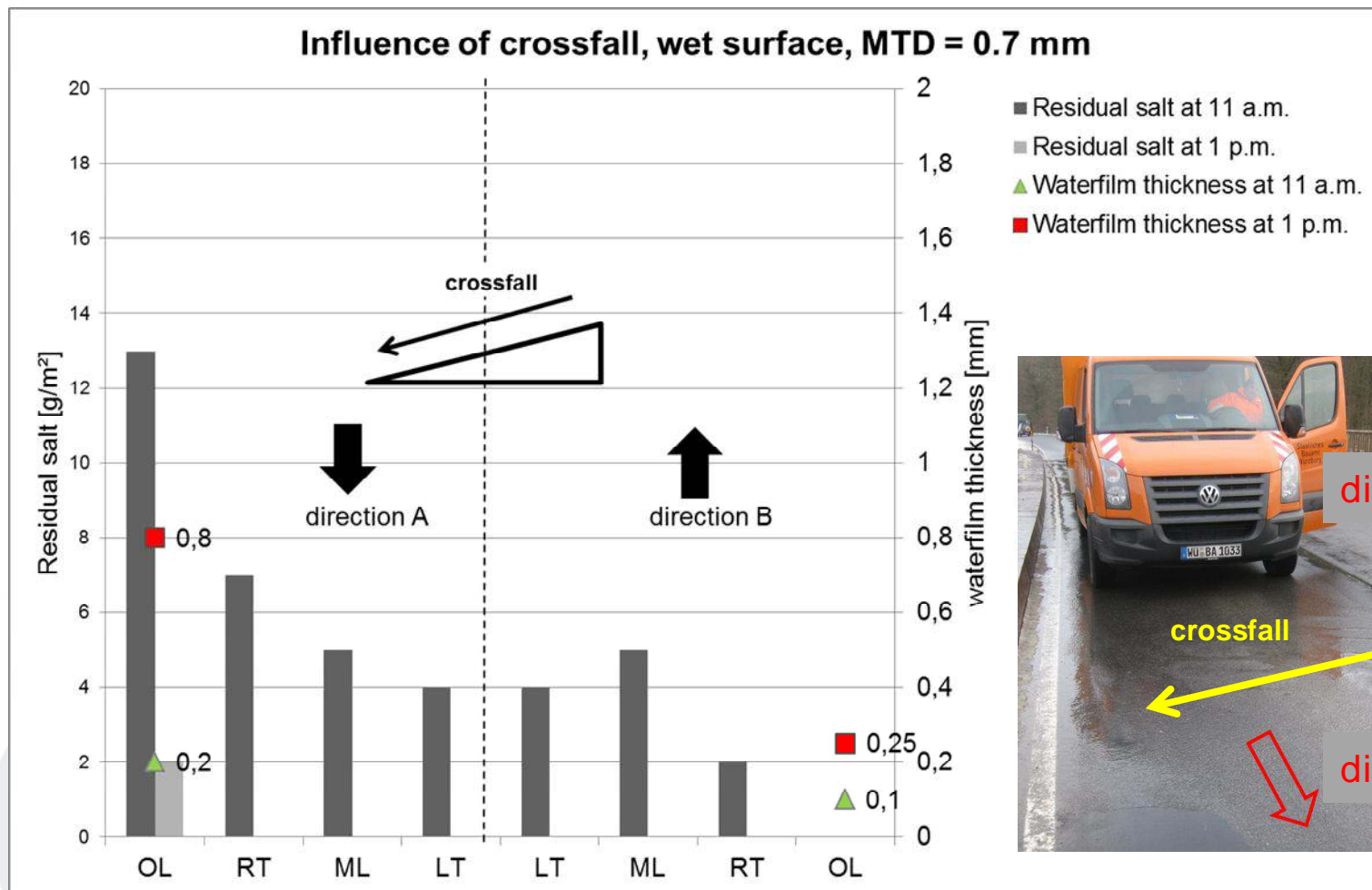
## 2. RESULTS – PREWETTED SALT, dry to moist surface



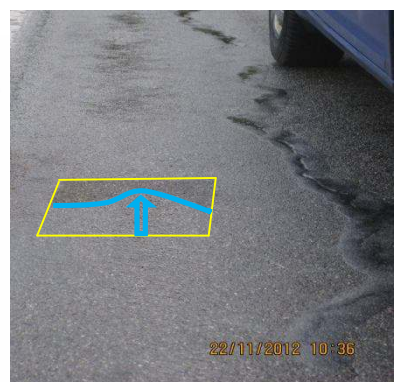
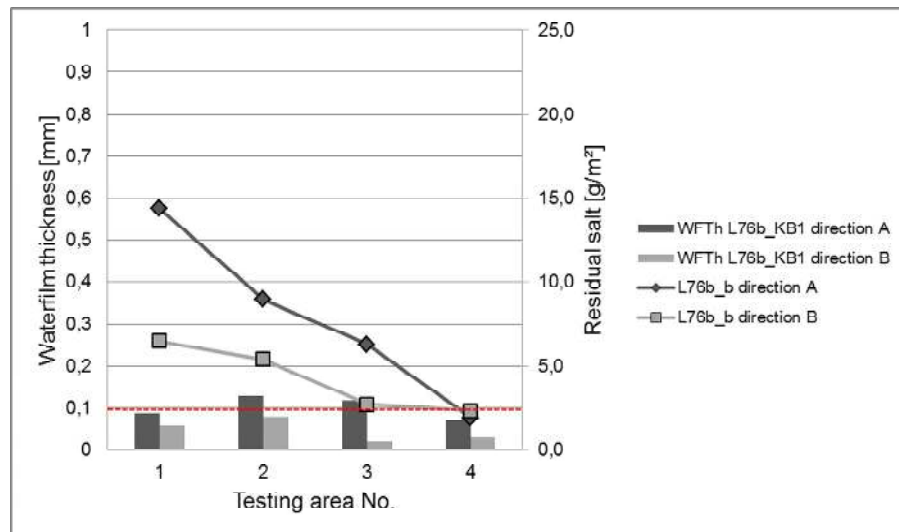
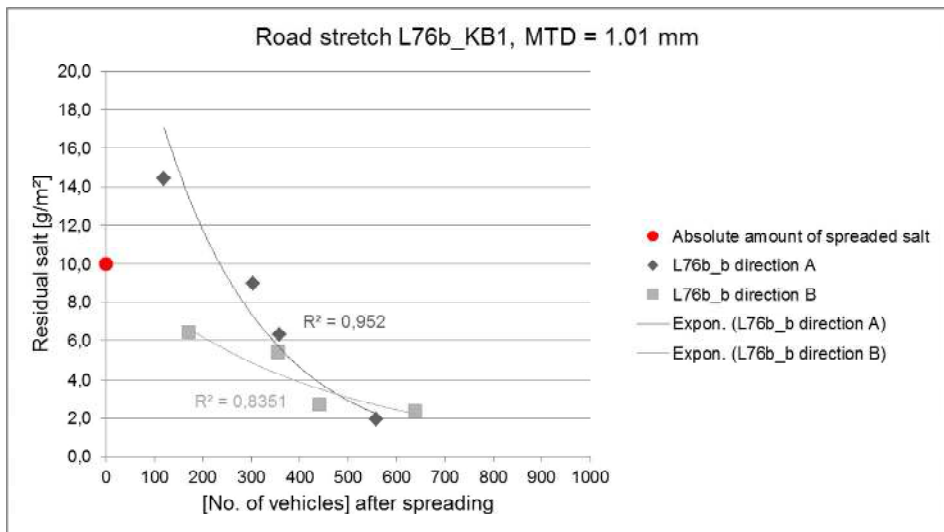
## 2. RESULTS – BRINE, wet surface



## 2. RESULTS – CROSSFALL, BRINE



## 2. RESULTS – FOG



## 2. CONCLUSION

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Road surface conditions	Number of vehicles possible of passing a road stretch after spreading to preserve suitable amounts of residual salt (average road characteristics)	
	Prewetted salt (7:3), 20 g/m <sup>2</sup>	Brine (23%), 20 g/m <sup>2</sup>
dry	5000 vehicles	1500 vehicles
moist	2000 vehicles	750 vehicles
moist to wet	1000 vehicles	500 vehicles
wet	500 vehicles	200 vehicles

## 2. RECOMMENDATIONS

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- For preventive actions with prewetted salt on dry or moist road surfaces, lower spread rates of 5 to 10 g/m<sup>2</sup> are sufficient.
- Spread widths 1m less than the width of the carriageway (depending on road category and daily amount of traffic) are sufficient when spreading prewetted salt (adjustment of spreaders!).
- The use of brine is as effective as the use of prewetted salt for preventive operations and therefore can save enormous costs.
- Spreading of brine on wet road surfaces as well as very low spread rates of brine below 20 g/m<sup>2</sup> cannot be recommended.
- Brine should only be spreaded shortly before icy conditions are about to occur. This is due to its high sensitivity for high crossfalls or gradients together with fast changing road surface conditions.
- A change for the organisation of preventive actions for prewetted salt should be thought of.

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**Thank you!**