



# ***Road Marking Tester – RMT®***

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**RAMBOLL**

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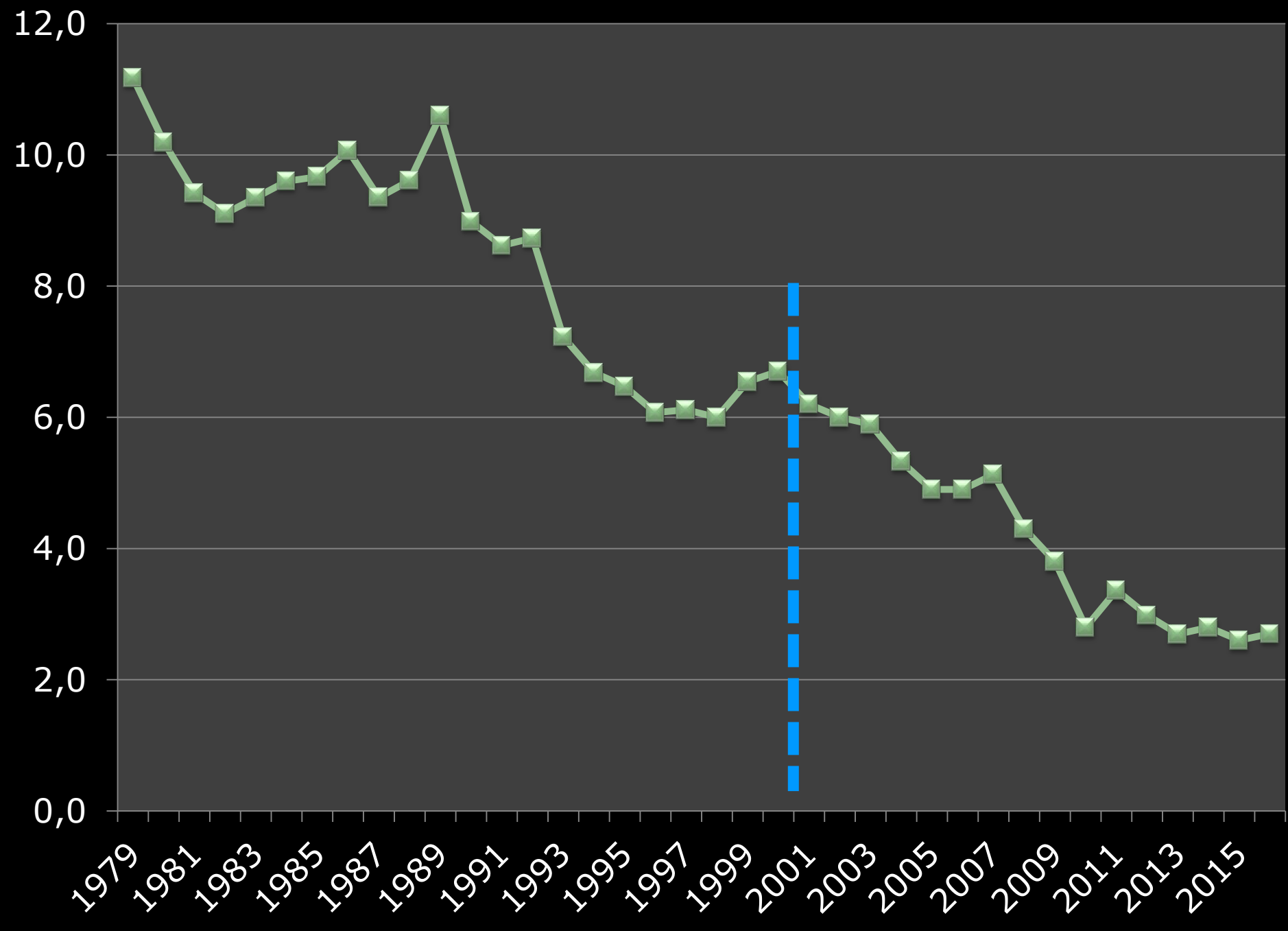
# The purpose of condition surveys

- Secure traffic safety
- Minimize negative user effects
- Effective maintenance planning/prioritisation
- Keep track on our infrastructure value and preserve our invested capital





# Traffic fatalities/100 000 persons (Sweden)





2+1 barrier separated roads

Profiled road markings

Noise profiles



# The importance of high quality markings

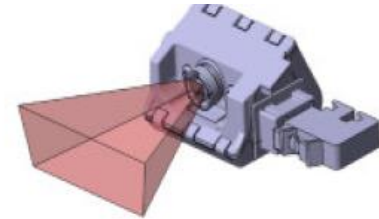
- **Visual guidance** a quality roadmarking supports the road user by outlining the direction and design of the road, enabling the car driver to plan a comfortable and safe ride.
- **Preview time** optical performance and geometry of roadmarkings are providing a safe reaction time during driving
- **Traffic safety** road markings help the road user to stay in the intended lane
- **Law enforcement** roadmarkings are a part of – and act as – a reinforcement of the traffic regulations
- **New technology** quality roadmarkings constitutes an essential support for new technology.....



..... new technology, like :

### **Driver Support Package**

- Collision Warning with Auto Brake
- Adaptive Cruise Control
- Distance Alert
- Lane Departure Warning (LDW)
- Driver Alert Control (DAC)
- Blind Spot Information system (BLIS)



# Systems for Autonomous driving





# Roadmarking performance for road users

## EN 1436

Daytime visibility,  $Q_d$

Nighttime visibility,  $R_L$  (in dry and wet condition)

Chromatic colour coordinates

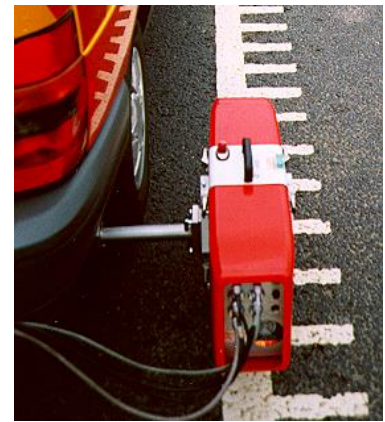
Skid resistance, SRT





# Control methods

By mobile equipment



By portable instruments, according to statistical test methods



Skid resistance





# A dynamic control is more efficient and safer

- Increased safety for the survey operators and the other road users.
- Restrictions regarding the use of handheld portable instruments.
- Control of maintenance contracts
- Continuous control of all the relevant parameters.

...a safer alternative

# All of the performance parameters with RMT3.0

- Night time visibility,  
Retroreflection dry
- Night time visibility,  
Retroreflection wet
- Day time visibility,  
Luminance coefficient (Qd)
- $\beta$  (Luminance factor)
- Friction
- Width/Length/Gap/Design/Wear
- Thickness of the marking





**C2S**



**EA1S**



**EK1S**



**G2S**



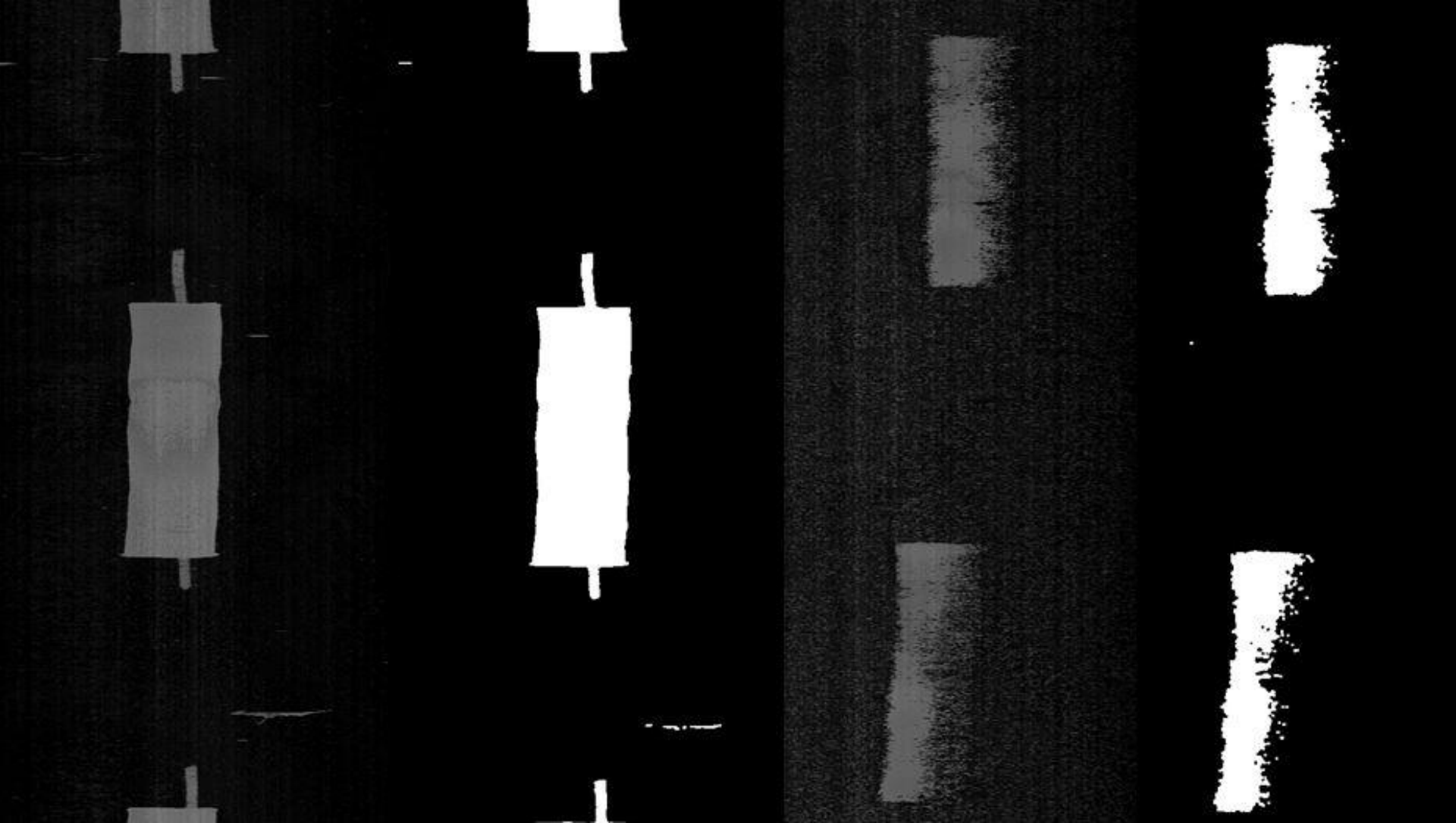
**N1S**



**SF1S**

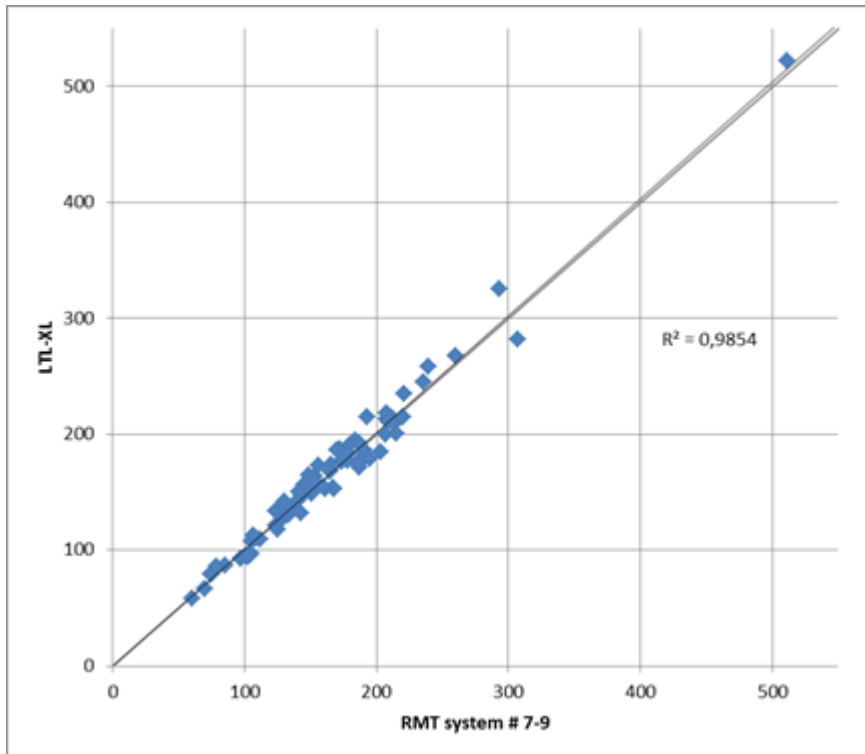




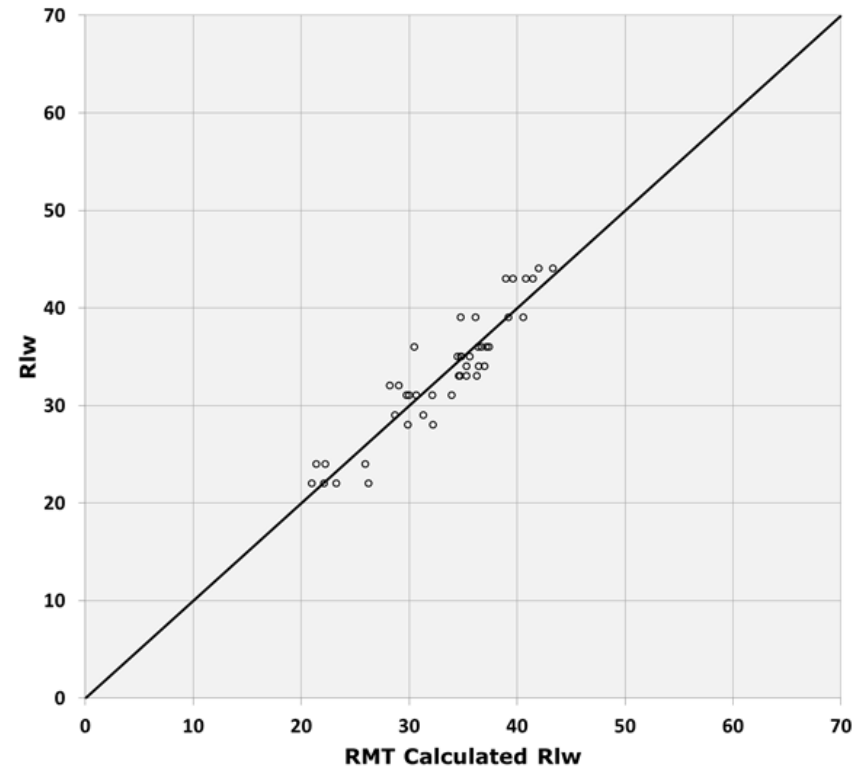


# VTI validation

**RL(dry),  $R^2=0,96$**

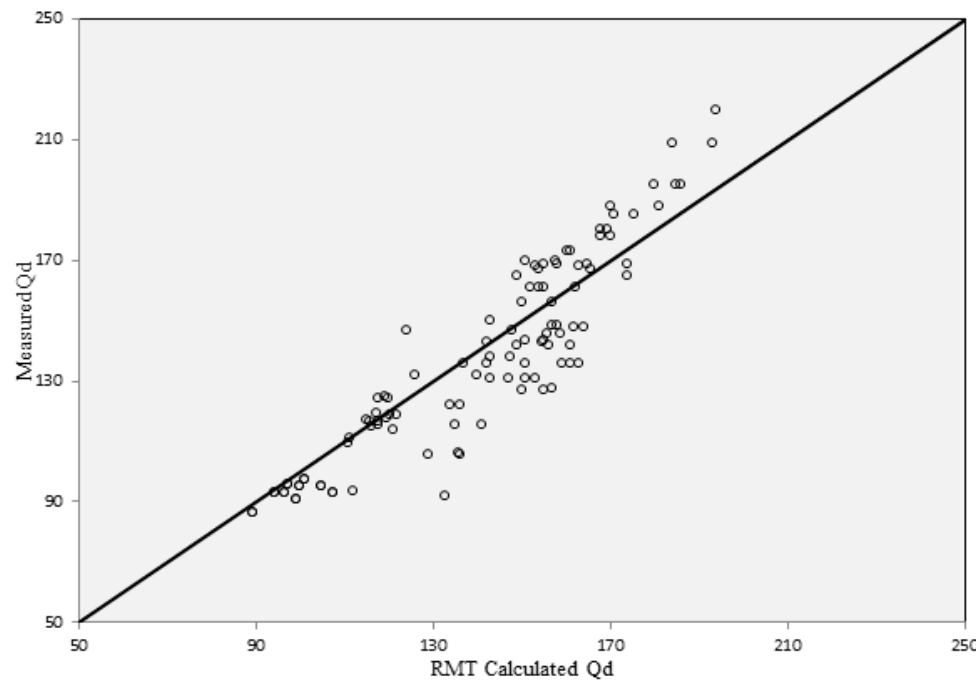


**RL(wet),  $R^2=0.86$**

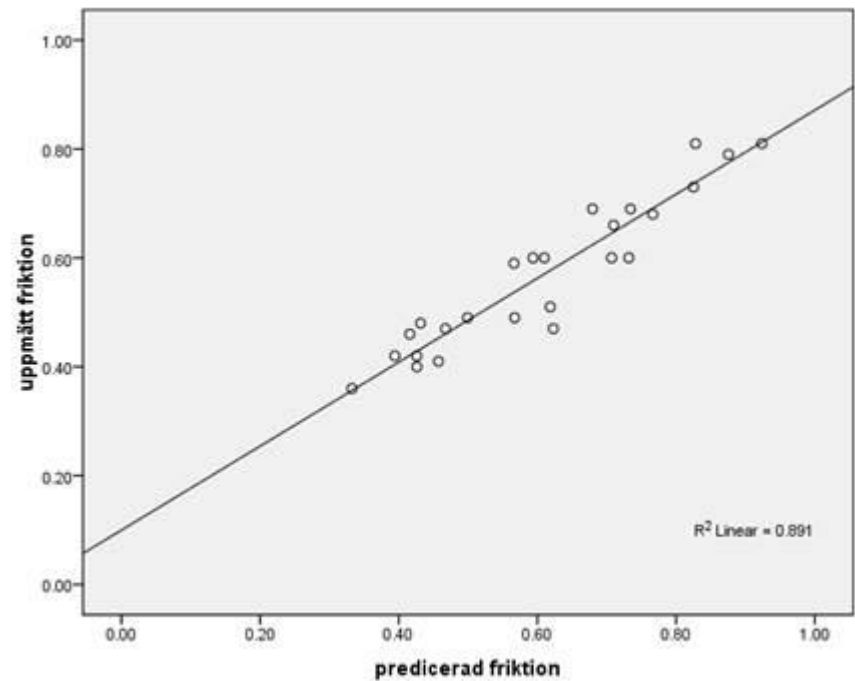


# VTI validation

**Qd,  $R^2=0.83$**

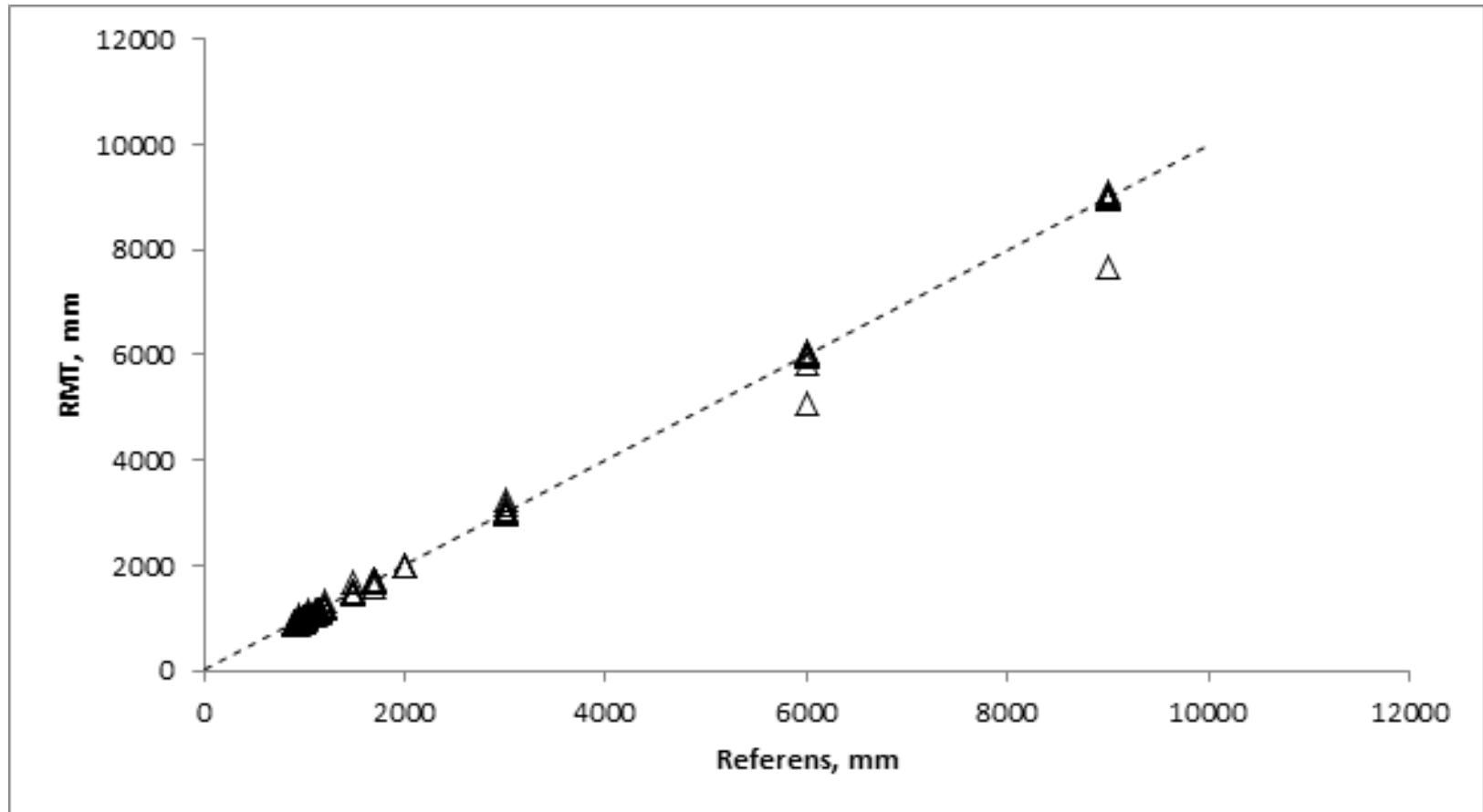


**Friction SRT,  $R^2=0.88$**

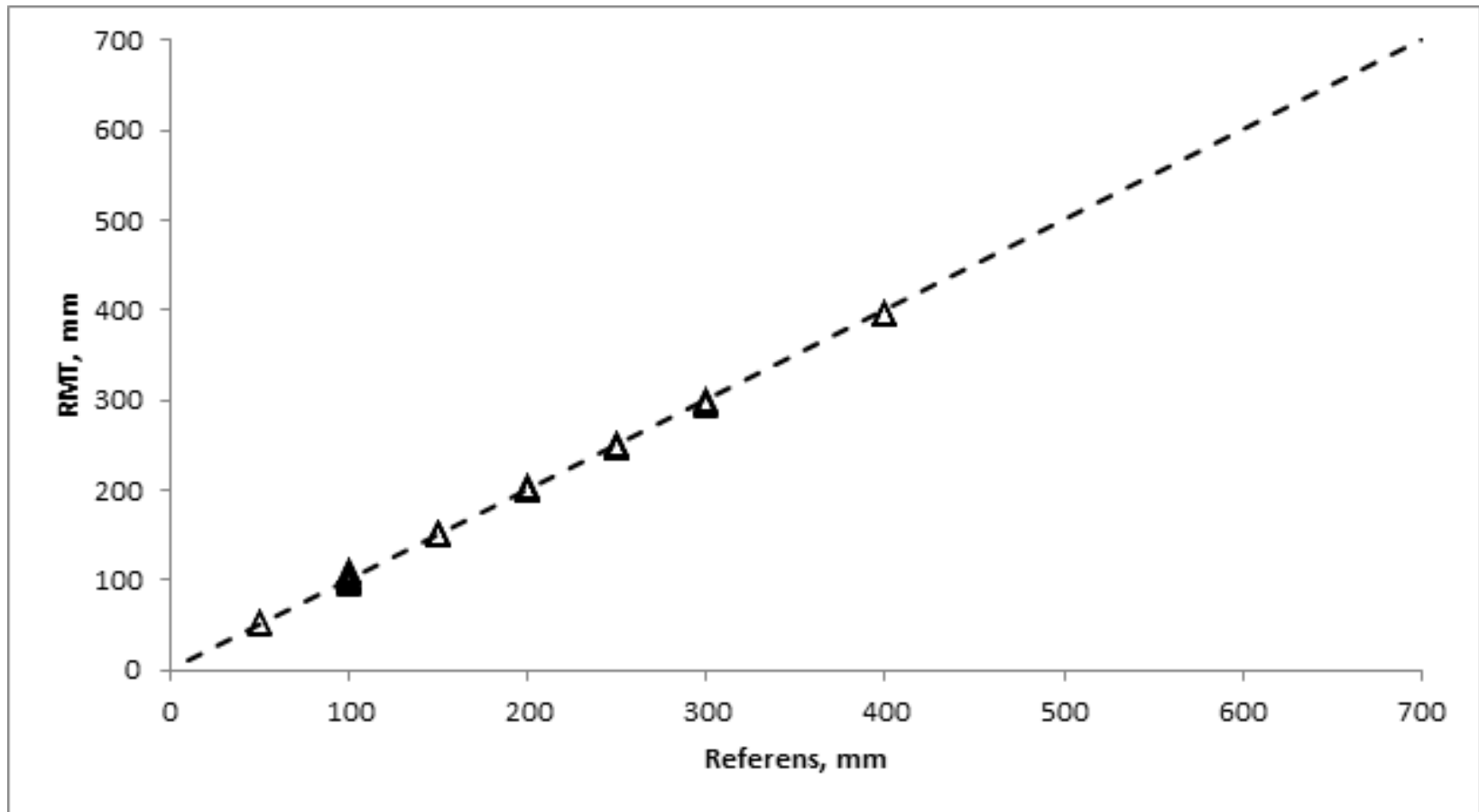




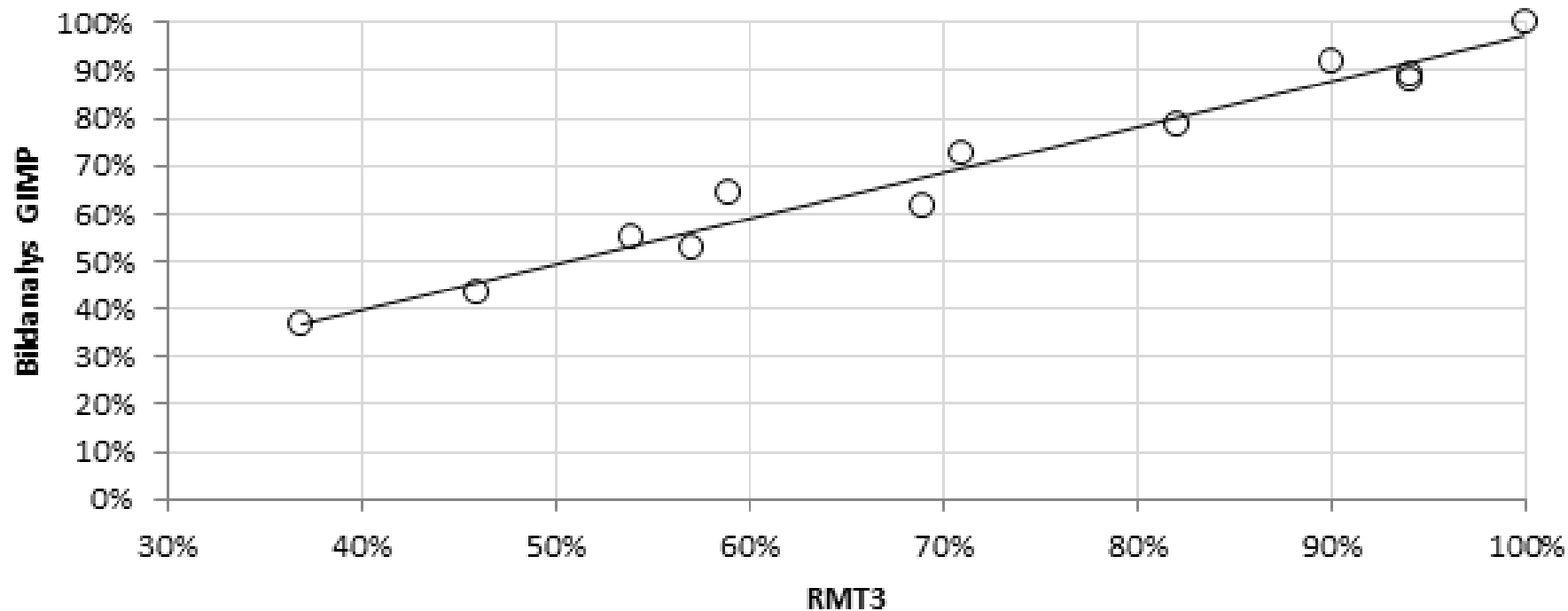
## Length, tests 2016 ( $R^2=0,99$ )



## Width, tests 2016 ( $R^2=0,99$ )



## Coverage, tests 2016 ( $R^2=0,96$ )







**SUCCESS**

## **Ramboll RMT survey volume 2017**

400 projects and 54 000 km

10 RMT systems in operation in 6 countries