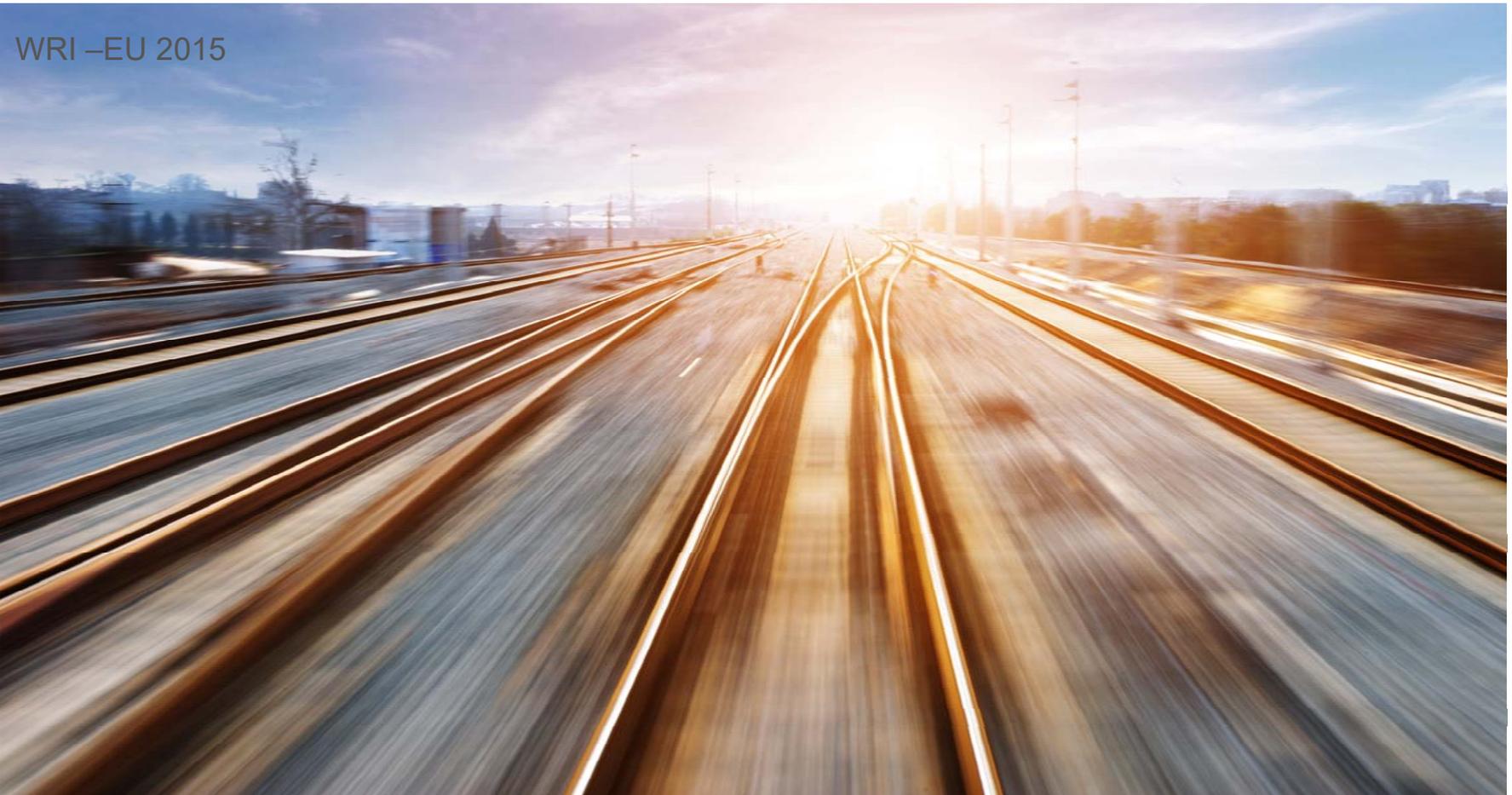


WATER AS A MEASURE AGAINST LOW ADHESION IN THE AUTUMN

Margreet Beuving





Adhesion-projects DEKRA Rail

Sandite



Smartsander

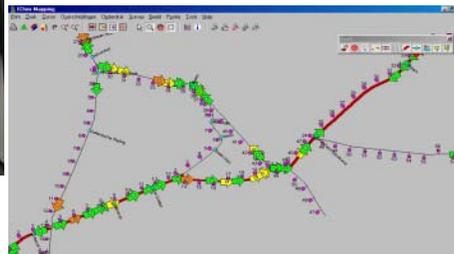


Immitation of slippery rails

Measurement of slipperiness



LAWS





Water Spray Installation

Content of the presentation

- What is a Water Spray Installation
- Description of the test stages
- Measurement methods
- Results of 3 test stages
- Effectivity on the main line
- Conclusions

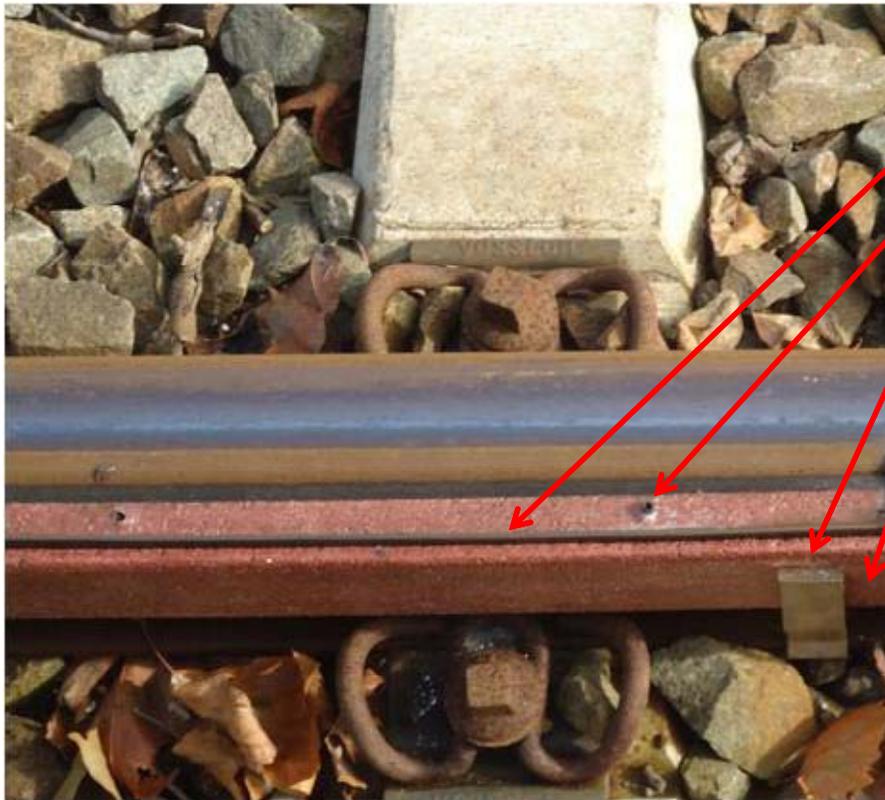


The idea

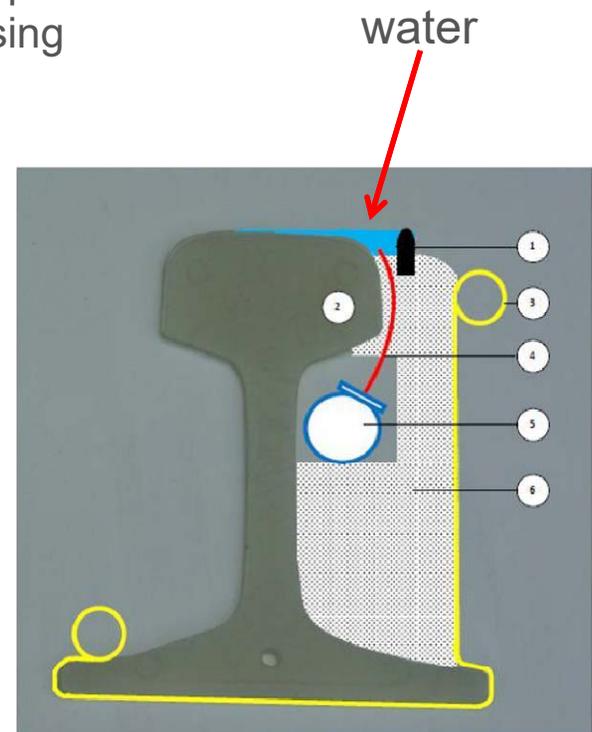
- Driver: 'slipperiness disappears after a good rain shower'.
- NSR developed the idea, and asked for patent.
- The aim is to reduce slippery track in the autumn.
- Existing measures are not always effective.



WSI track lay out

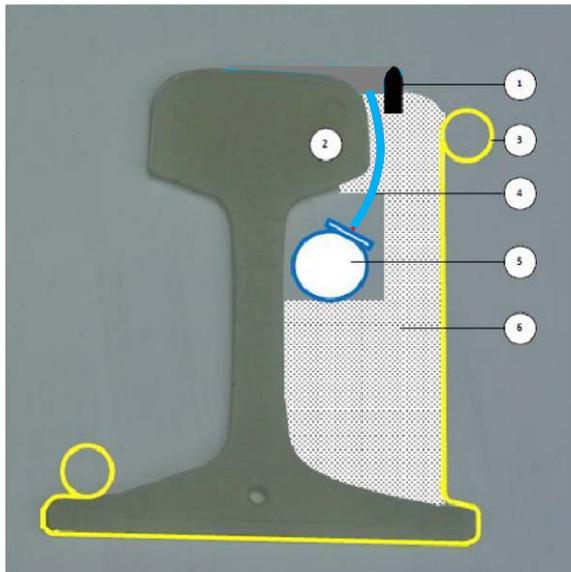


- 1. Limiting strip
- 2. Dripping device
- 3. Clamp
- 4. Housing



Functioning Water Spray Installation

- Just before each train approach the water bath is filled.
- Present leaf layer is weakened by the water.
- Passing wheels whipe the leaf remainder away.
- New leaves do not attach to the rail.



Water usage

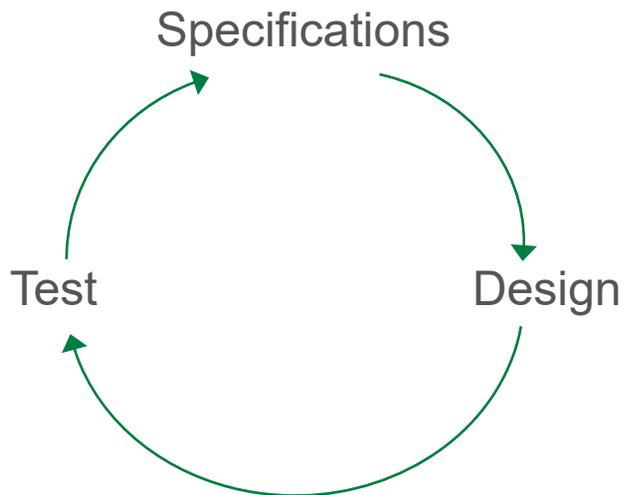
- 250 ml water per meter per passage
- Per day less than an average rain shower!

Train runs over the WSI



Test stages WSI

Test stages



5 test stages

- 10 meter test track - WSI version 1
- 10 meter test track - WSI version 2
- railway yard - WSI version 3
- railway yard - WSI version 4
- main line - WSI version 5

Test stages



Fotos WSI

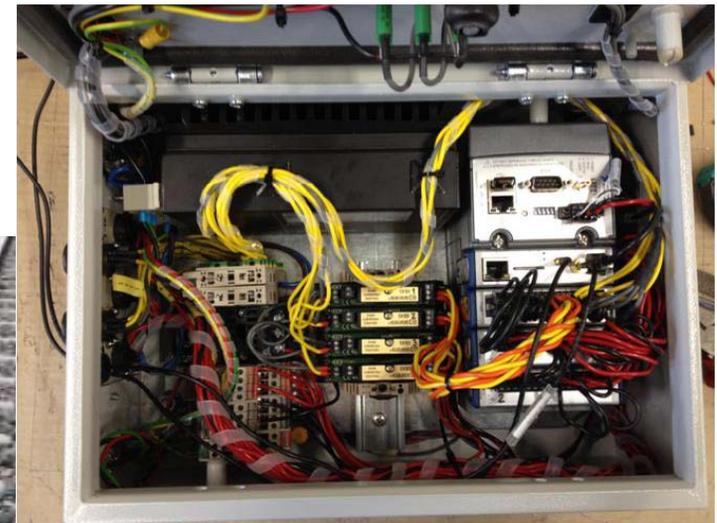
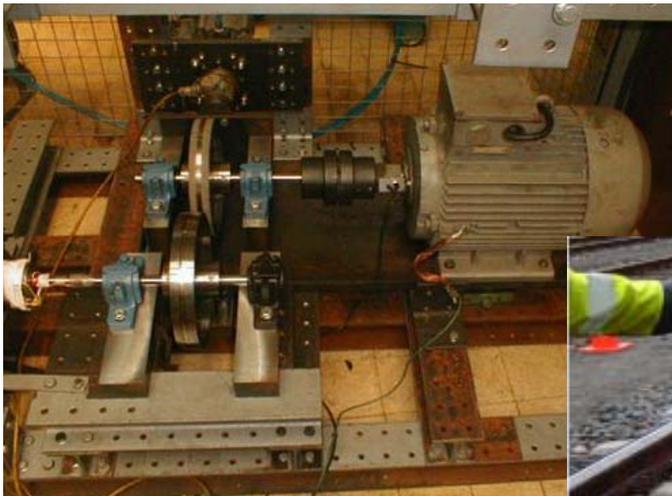


Measurement methods

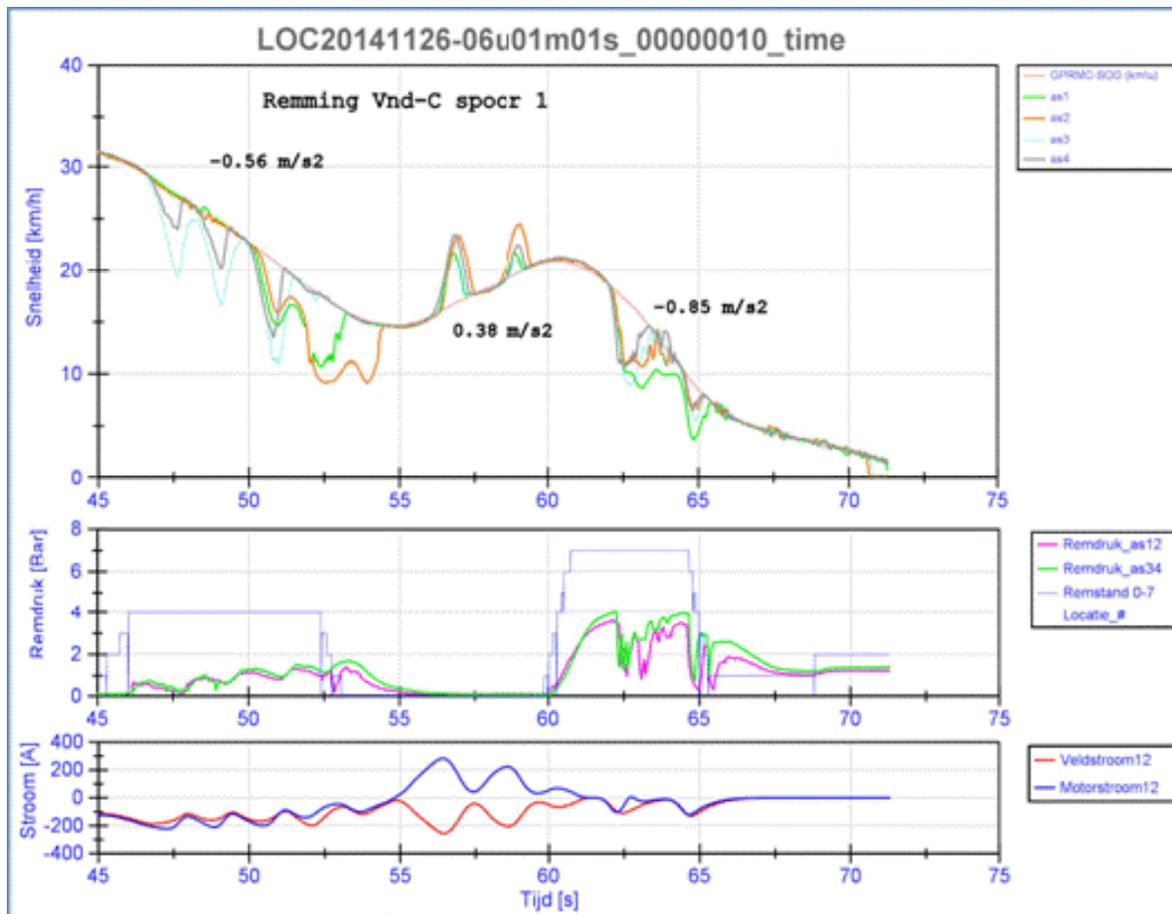
Measurement methods

- 2-disc machine
- Rail Tribo Meter
- Acceleration/deceleration by on board system
- Observations of slip in the train cabine

laboratory
test track, railway yard
railway yard, main line
main line



On board system



Results of 3 test stages

Test approach

General approach

- Application of leaves
- WSI switched on
- Measurement after each train passage

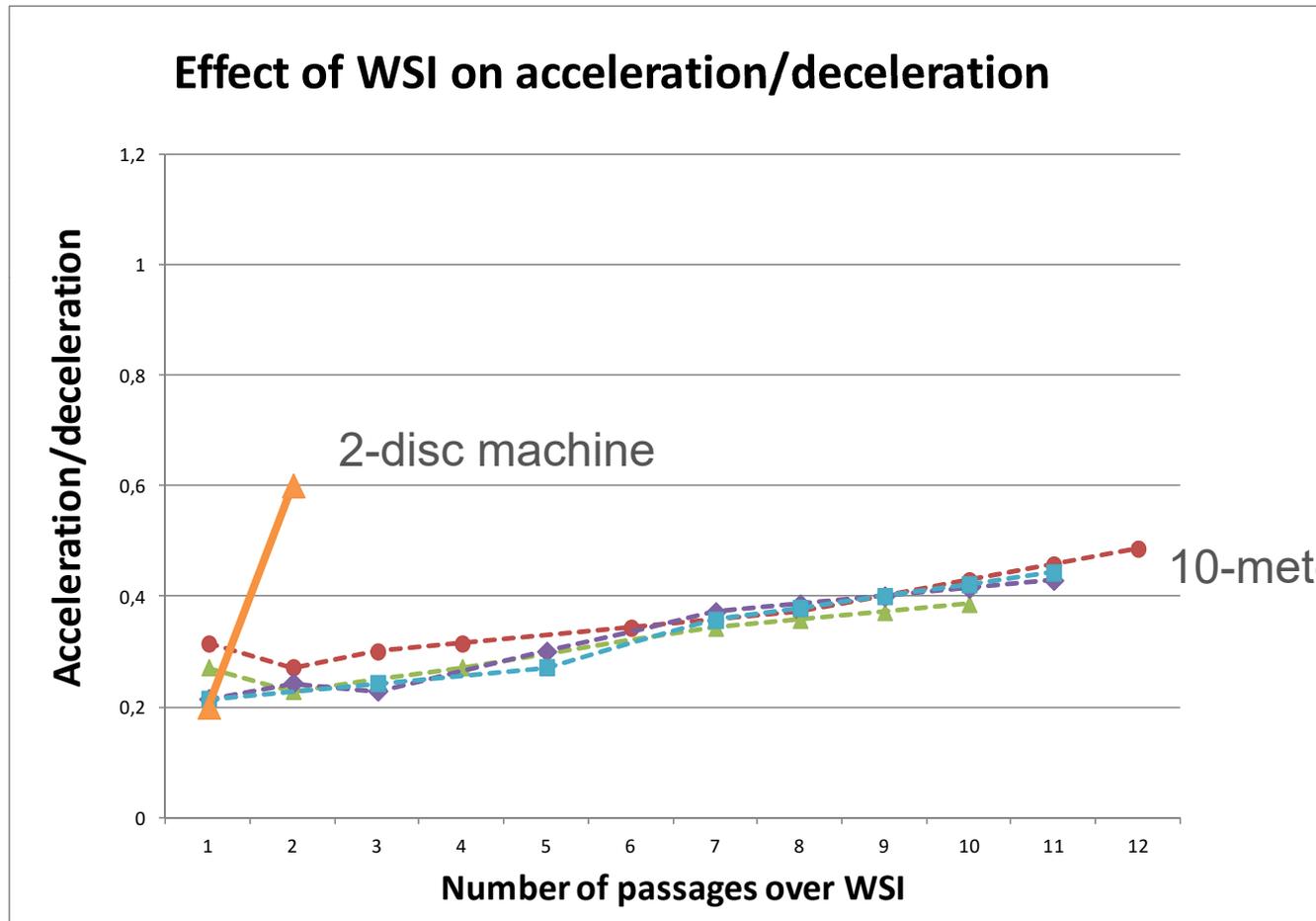
General - first leaves, then water

Also tested - first water, then leaves

Main line - WSI switched on in periods

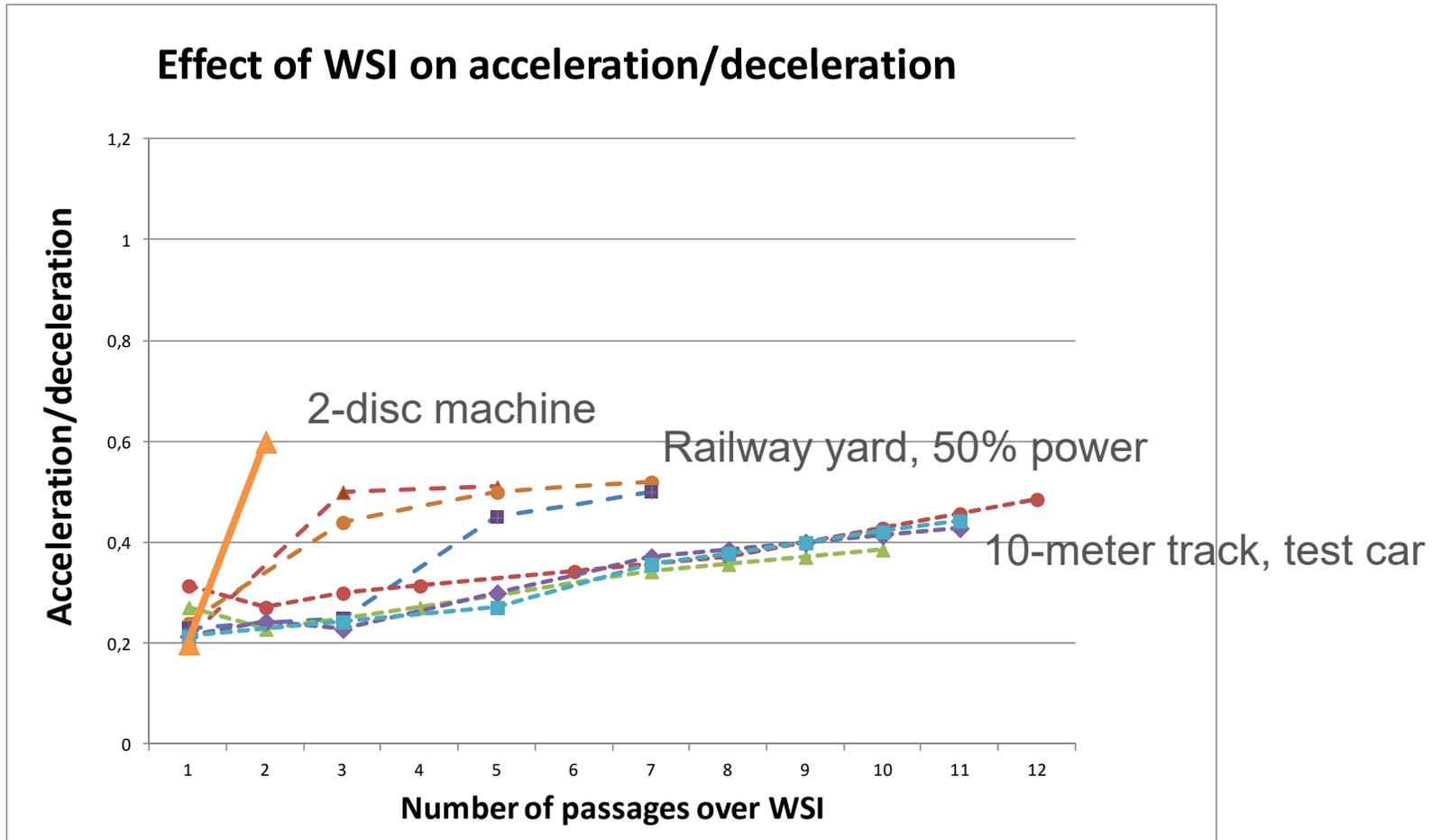
- start measurements on slippery track

Results of 2 test stages

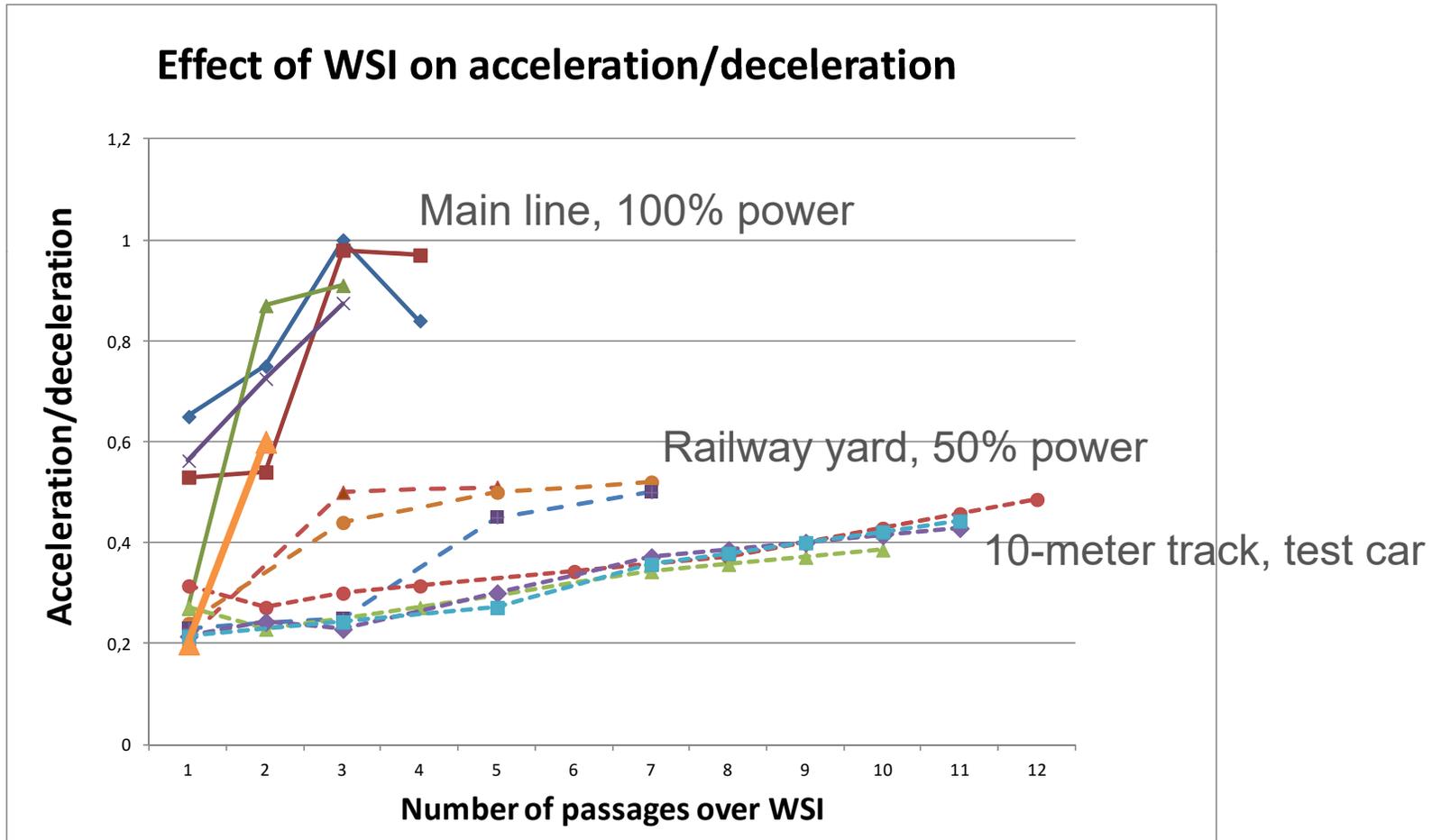


10-meter track, test car

Results of 3 test stages

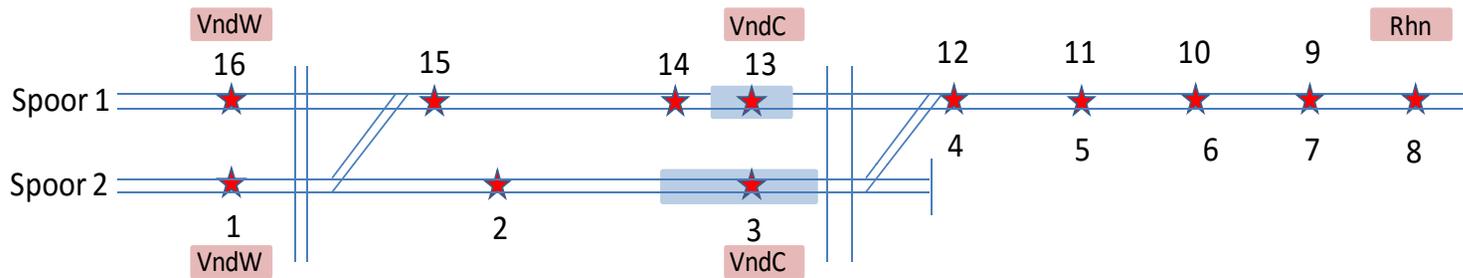


Results of 4 test stages

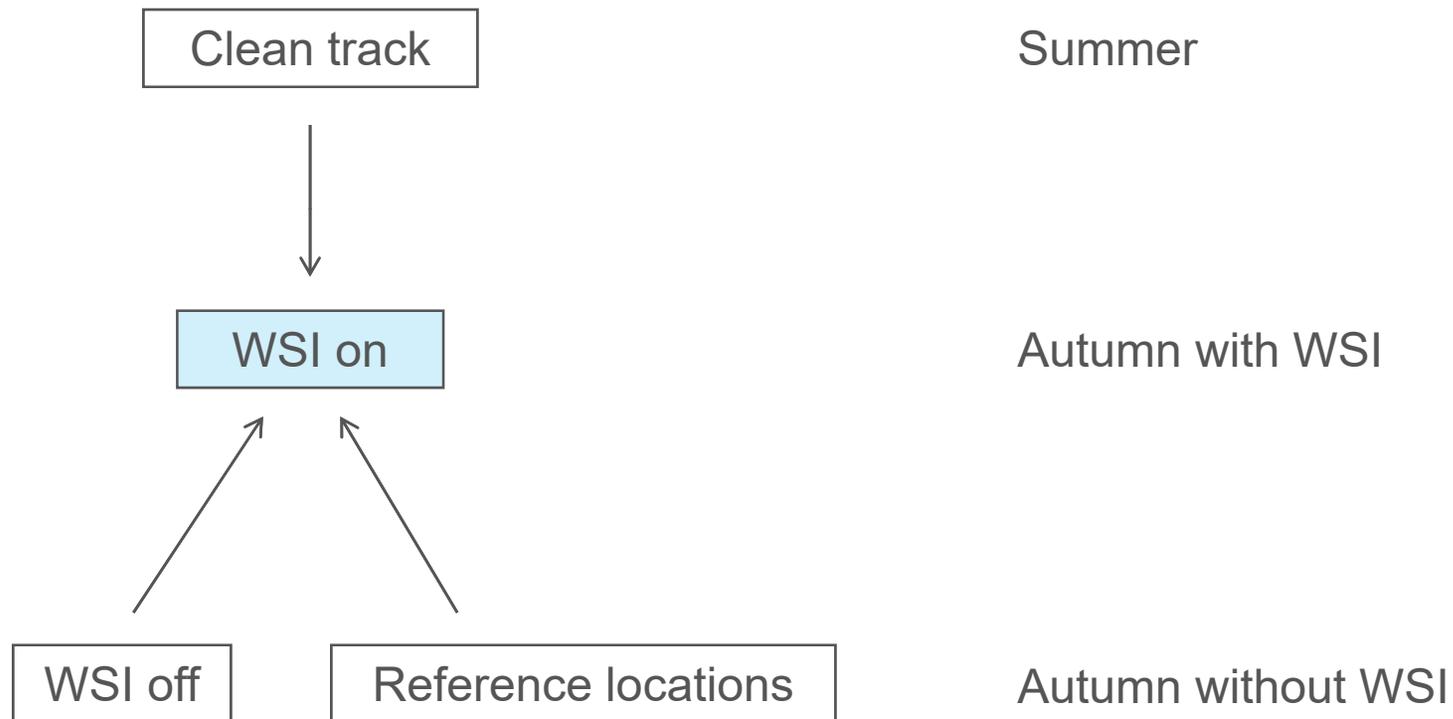


Effectivity on the main line

Measurement locations main line

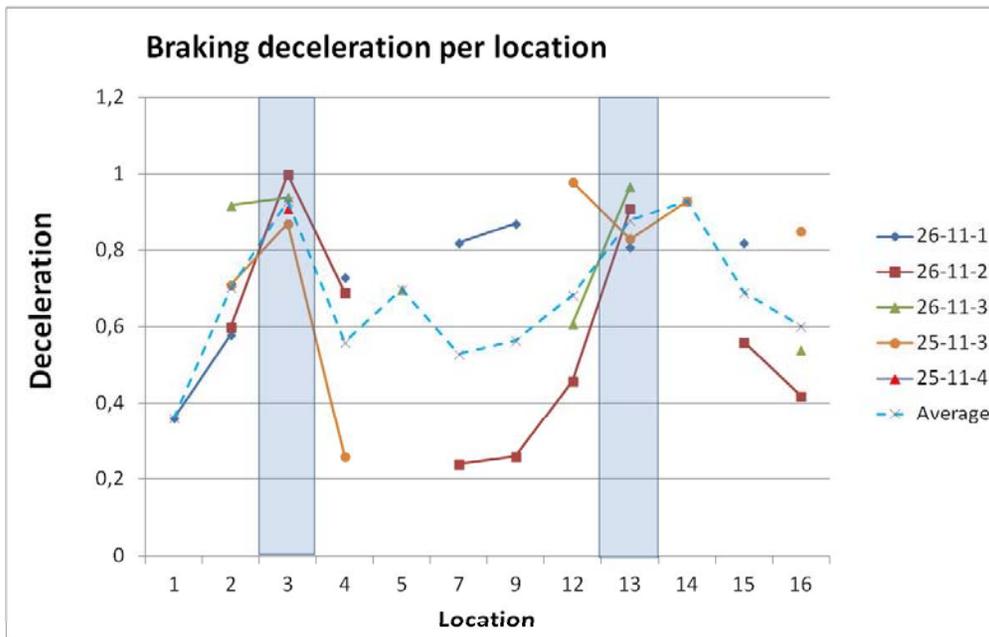


Reference situations main line



SLT entering the station

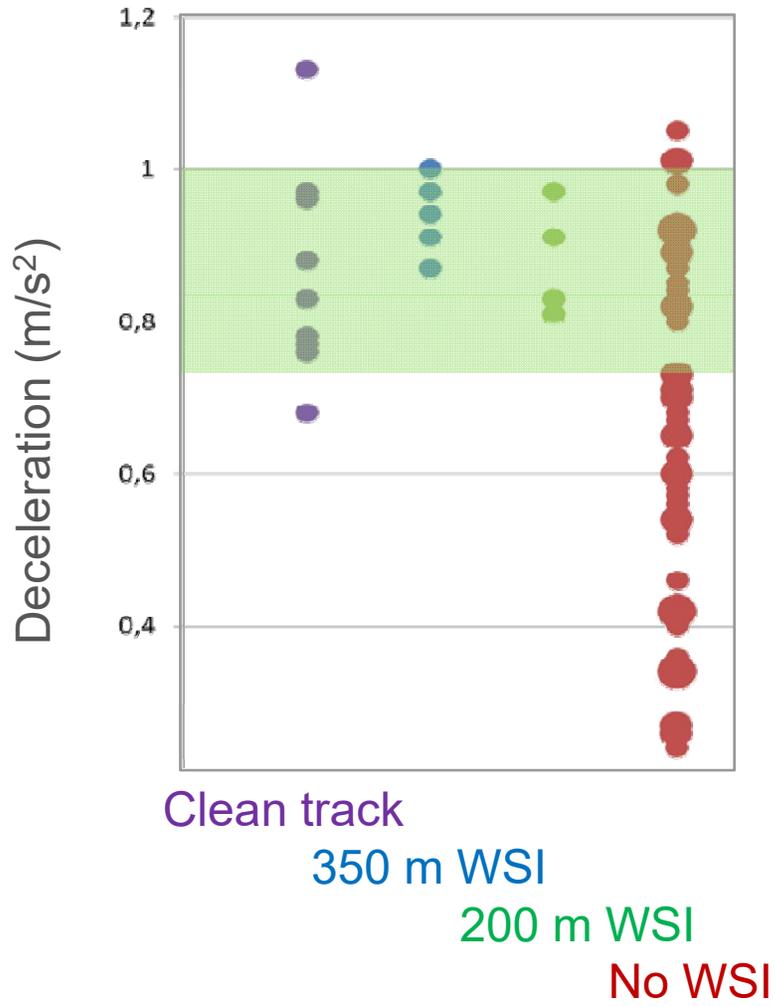
Results main line - braking



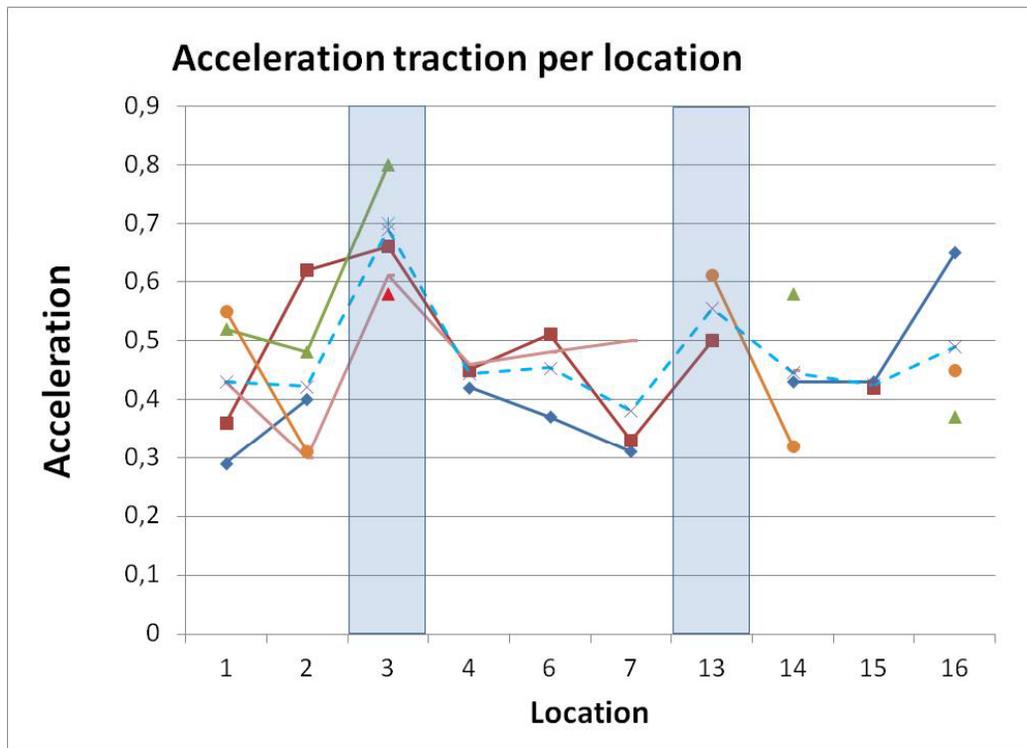
100% braking power

Low acceleration on non-WSI locations

Results main line - braking



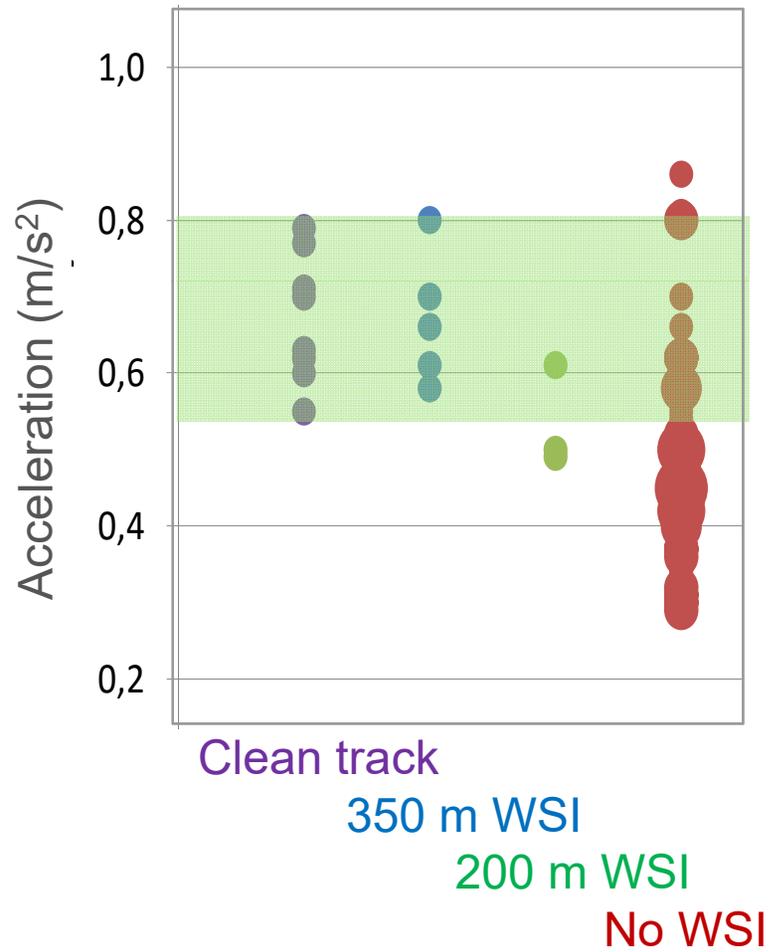
Results main line - traction



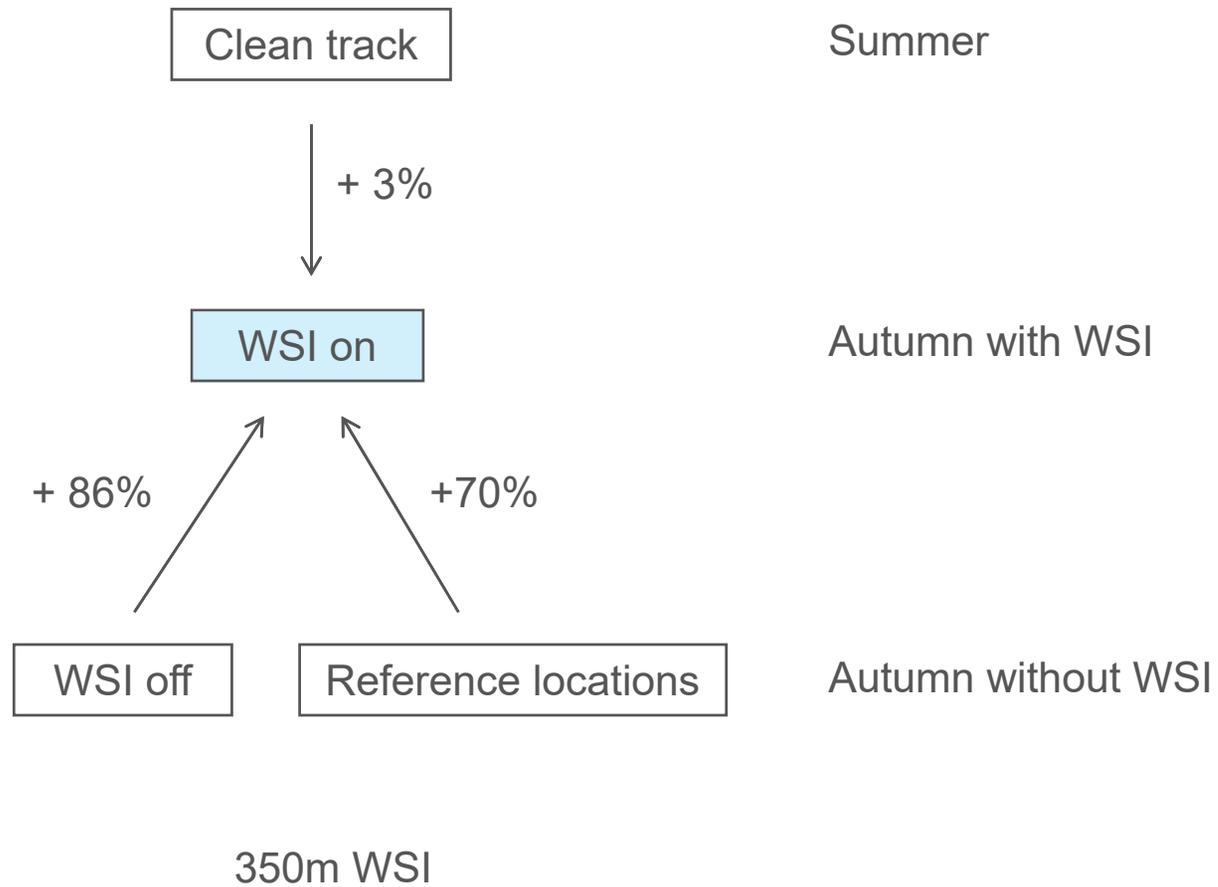
100% traction power

Low acceleration on non-WSI locations

Results main line - traction



Increase of acceleration/deceleration by the WSI



Conclusions

Conclusions effectivity

- WSI is effective for constraint/limitation of the braking and traction distance.
- WSI has the potency to increase the reliability of the train service.
- Attention for 'human factors' and communication. Timely instruction of the train personnel.



Conclusions application

- The WSI should be continuously active.
- The length of the WSI can be determined by train length + braking distance
- Interruptions of several metres are acceptable (crossings, welds).

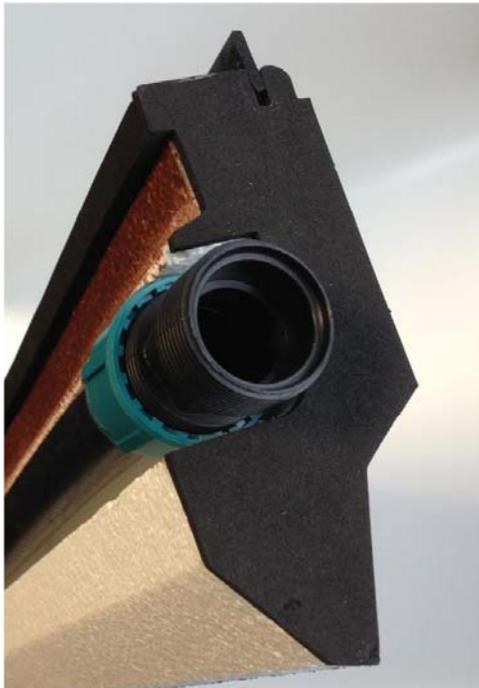


WSI in the future

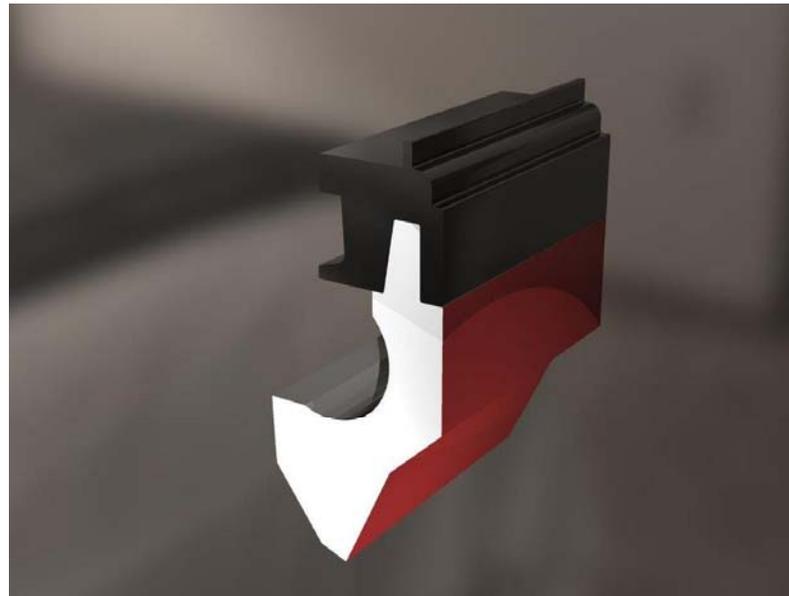
The design has been improved since 2014.

This design is to be tested, possibly in 2016.

Procedures, instructions and user manuals have to be drafted.

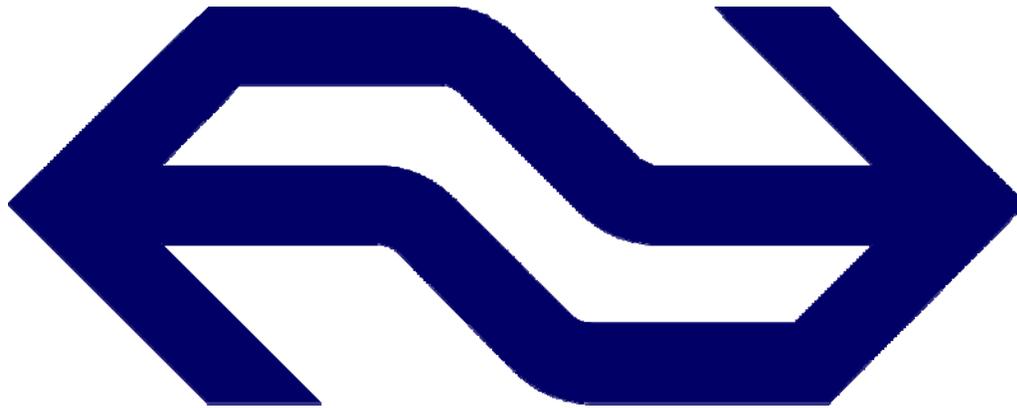


WSI version 5



WSI version 6

Cooperation by

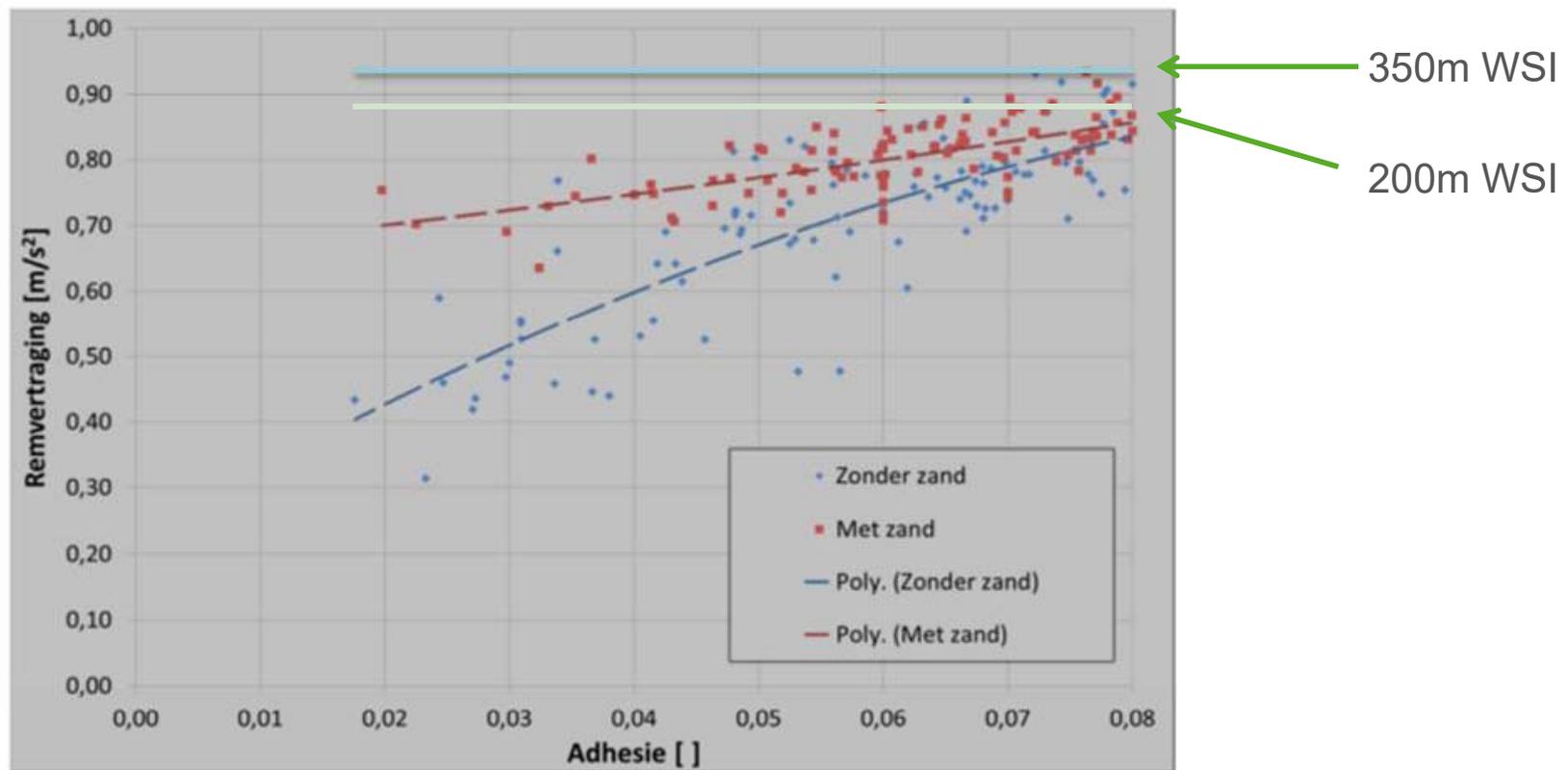


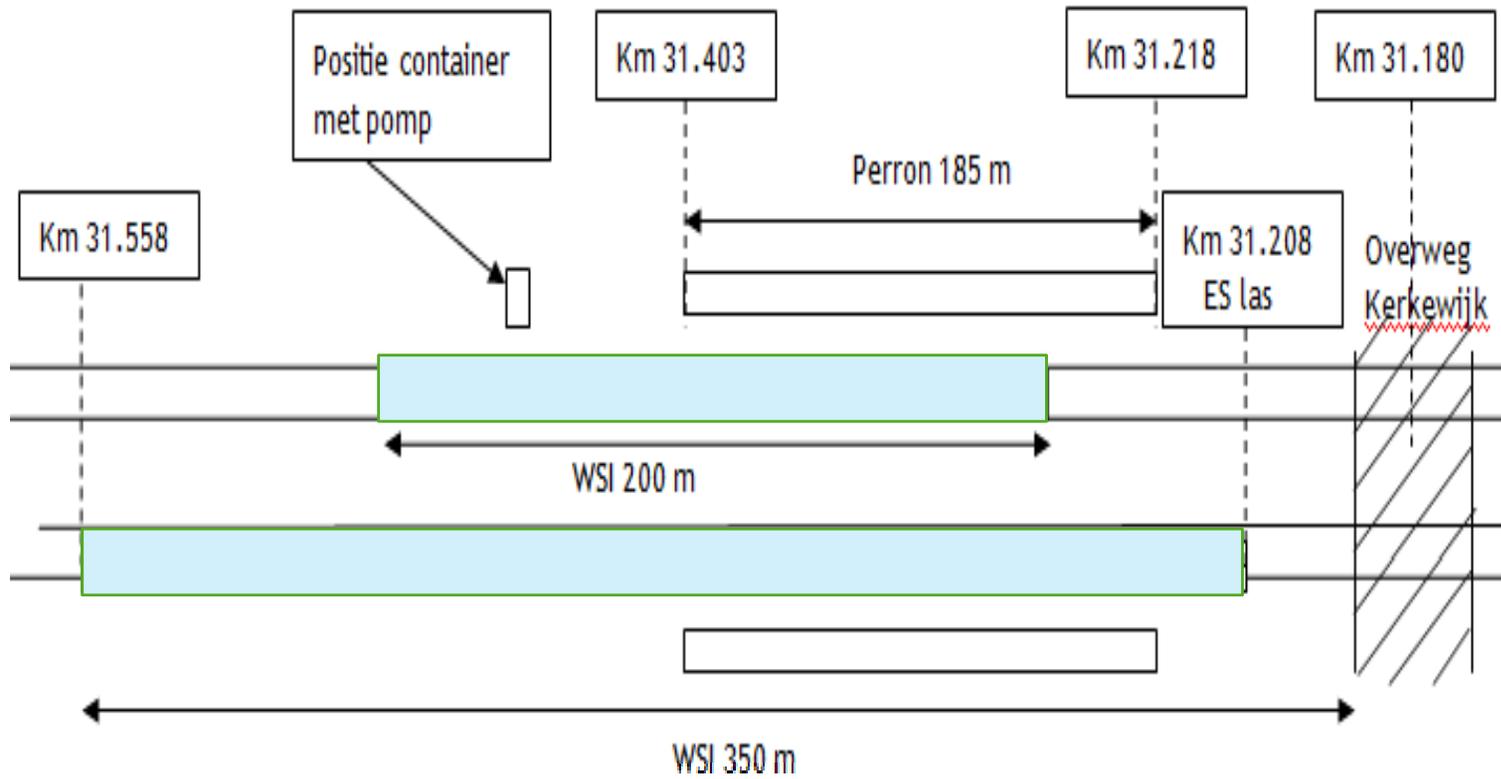
Results 3 different test stages

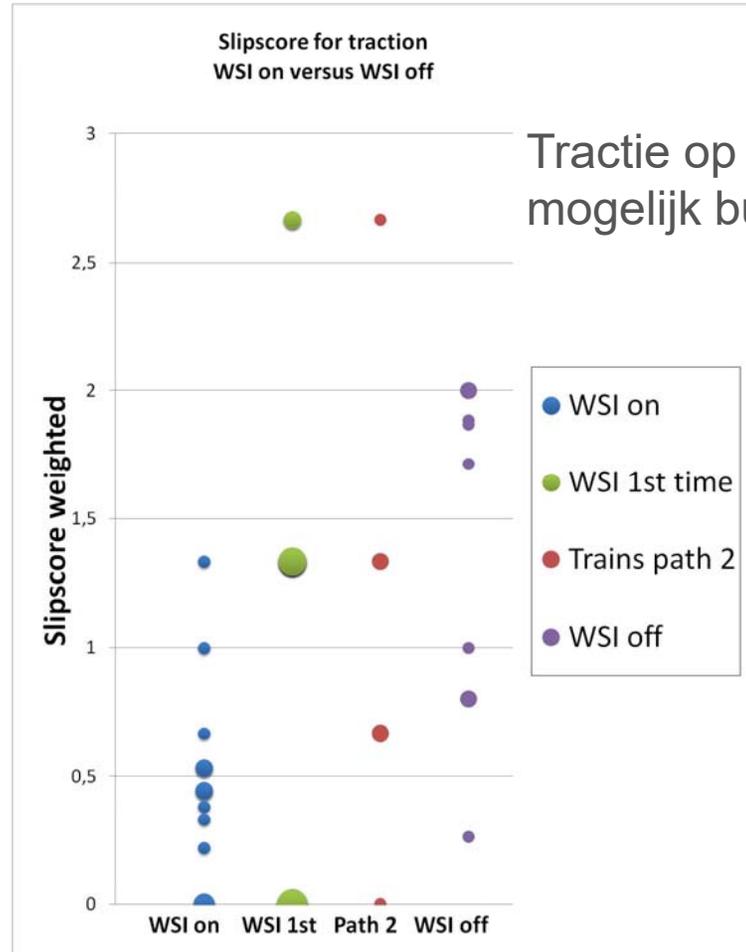
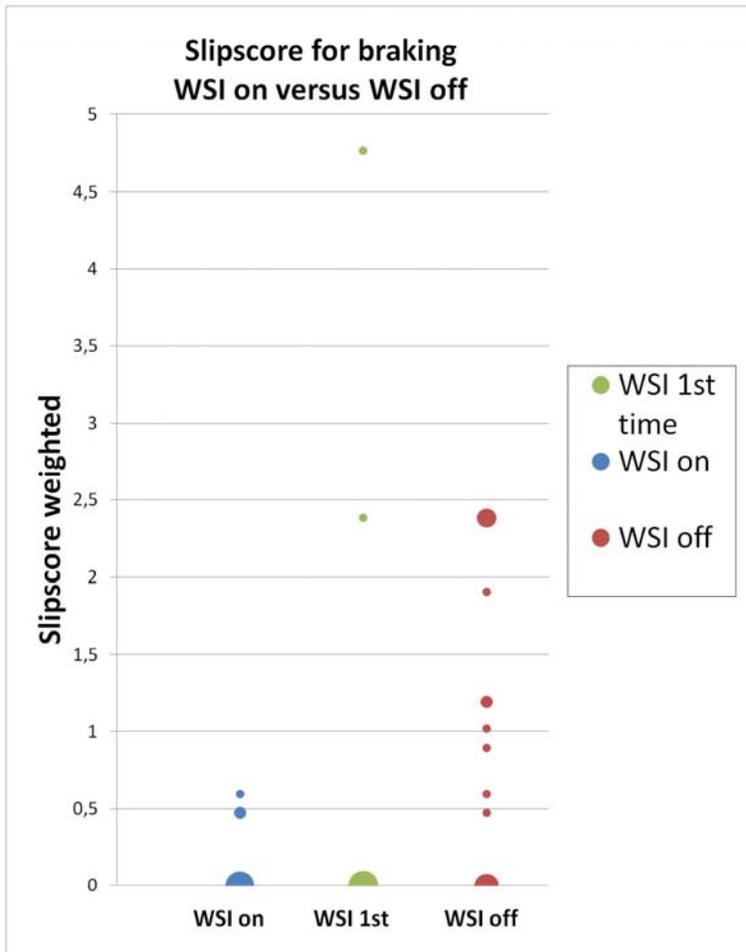


Clean wheels after passage over the WSI

Vergelijking met Zandstrooier - remmen







Tractie op de 200m WSI mogelijk buiten de bak

