



**INFRABEL**

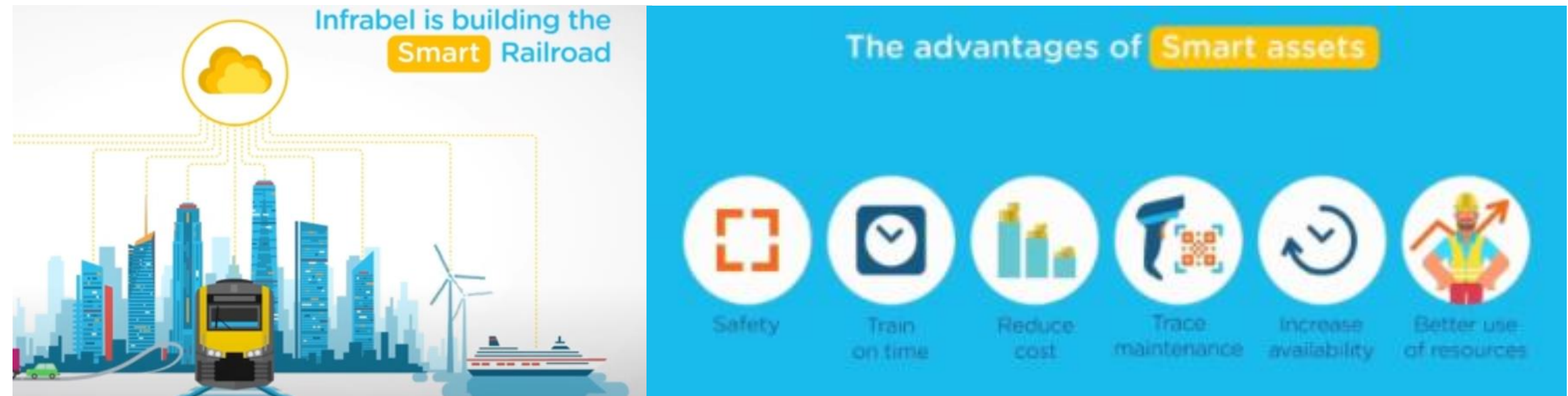
# Switches and Crossings Monitoring

**Predict the necessity of tamping operation in S&C**

Ir. Gérémy Bourgois

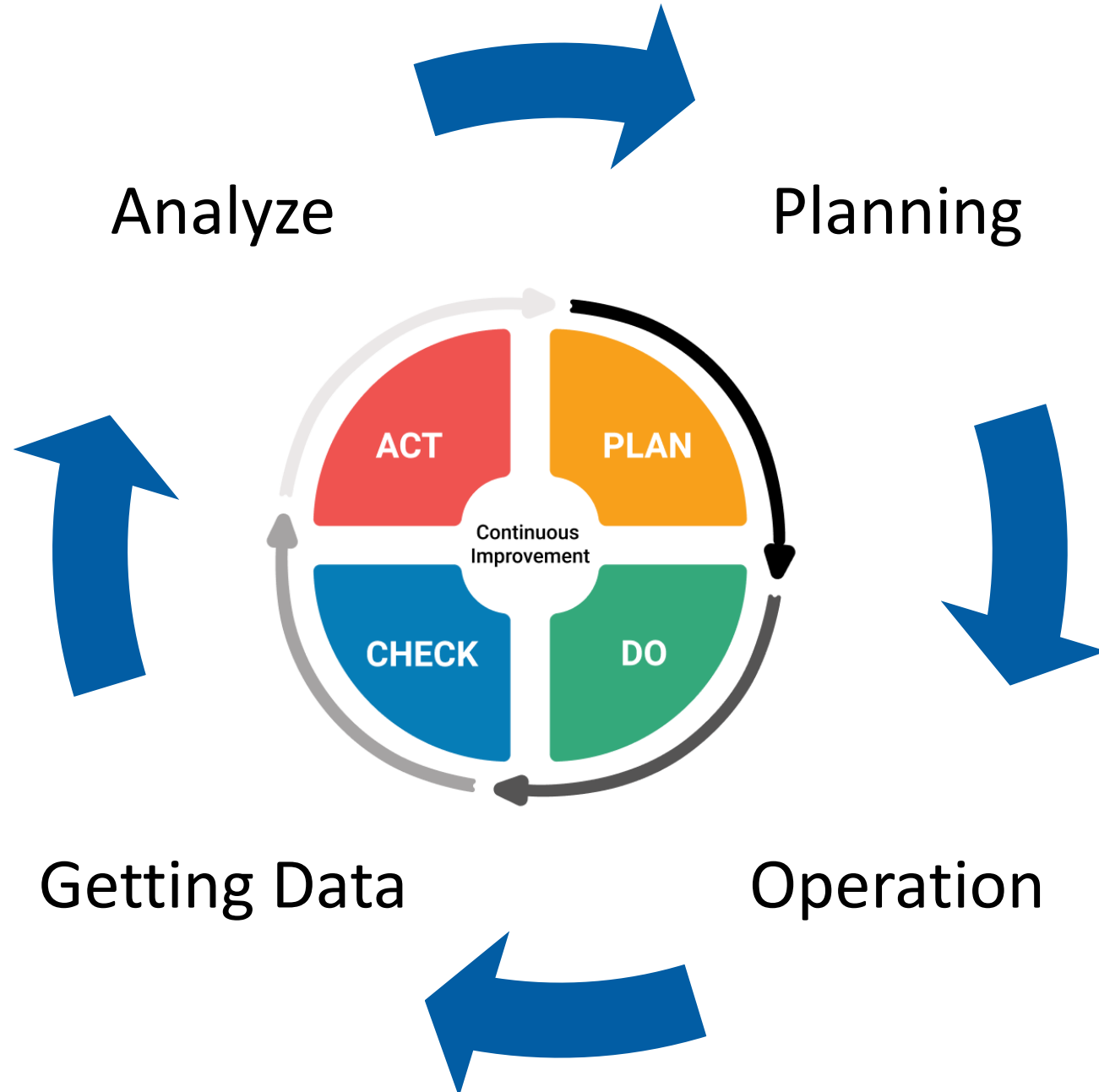
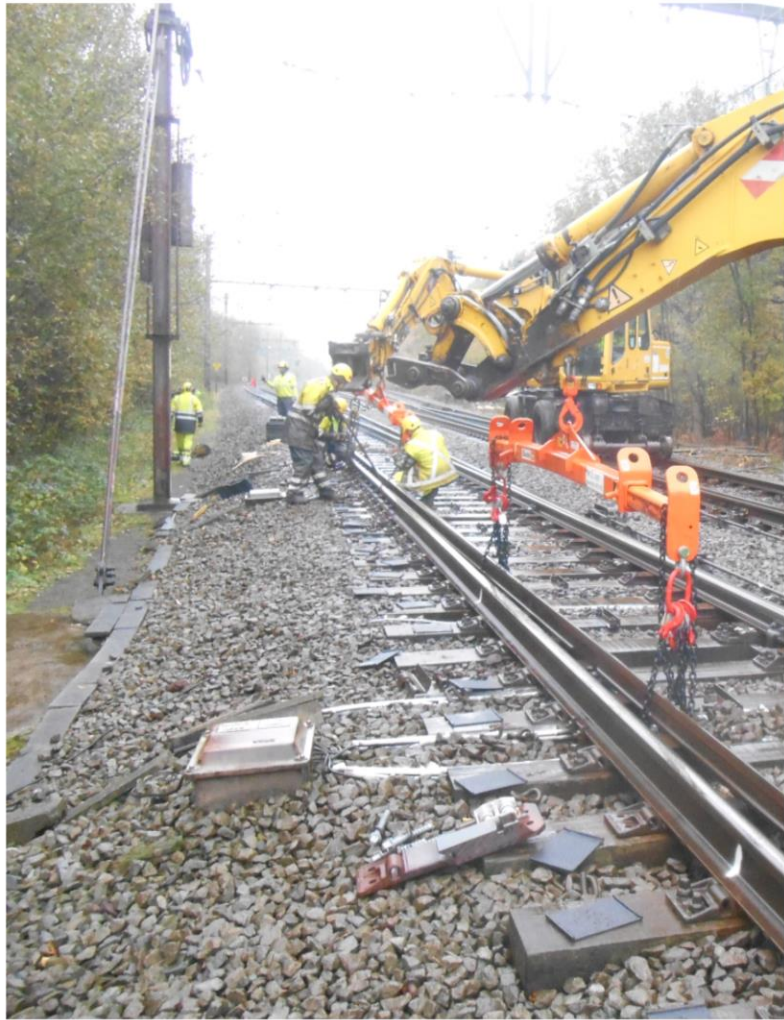


# Move from reactive to predictive





# Operational Model



- Current situation for the track bed maintenance
- Digital void meter project
- Conclusion





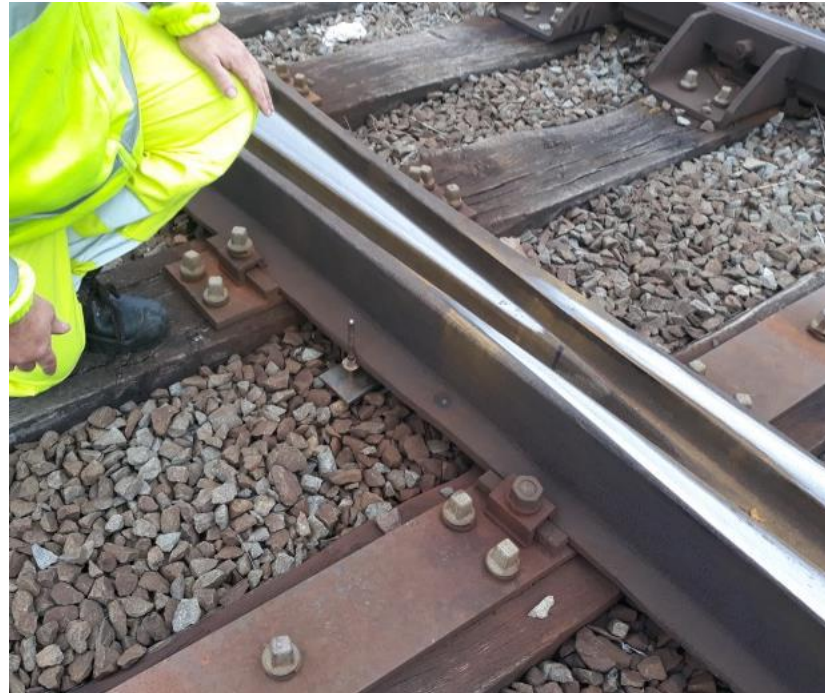
# S&C Inspections

- Maintenance operations initiated by switch inspections.
  - Every four/eight weeks : visual inspection
  - Every six / twelve months : S&C are measured + visual inspection.



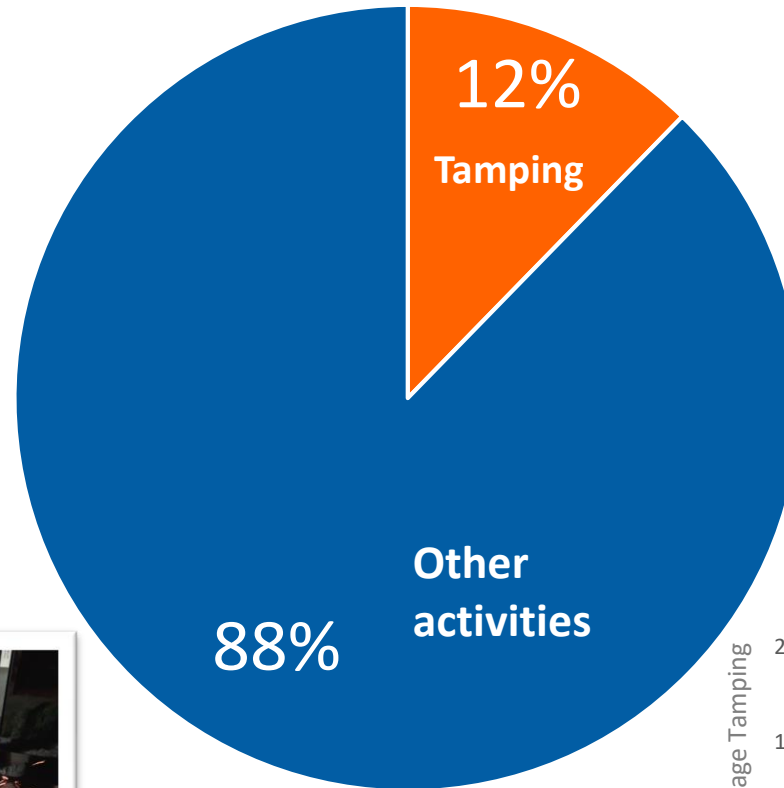
# Vertical Displacement

- S&C inspection provides the value of the vertical displacement
  - Obtained with void meter
  - Estimated value

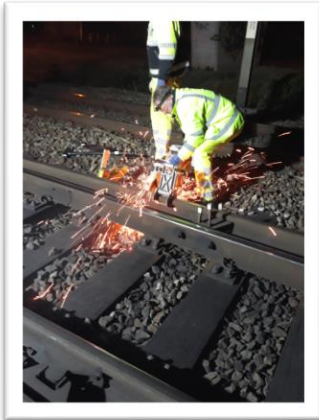
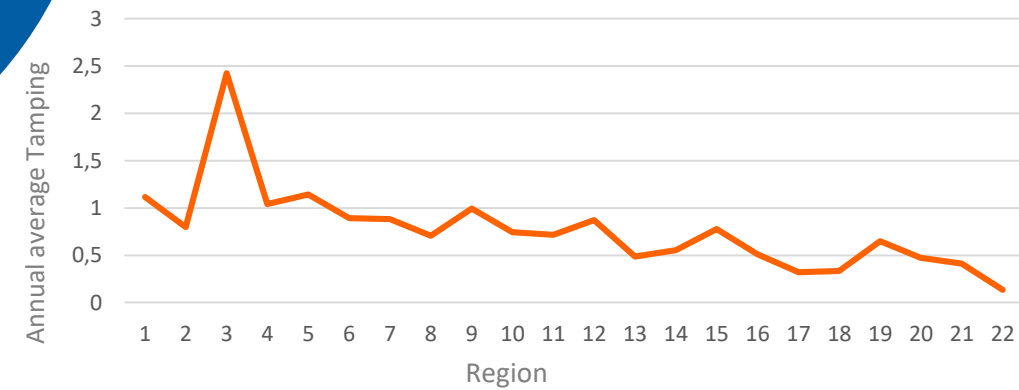




# Maintenance operations



Annual average S&C Tamping by region

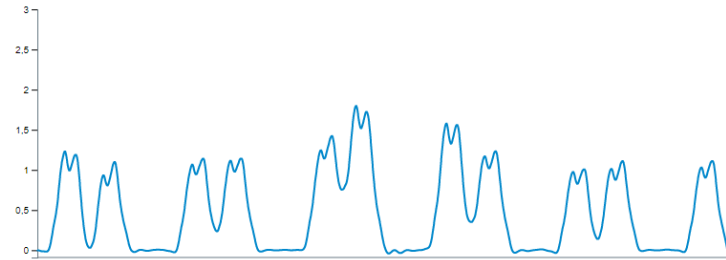


# Tamping Operations





# Test at Infrabel



## Health Overview



● Healthy

**3**

● Poor

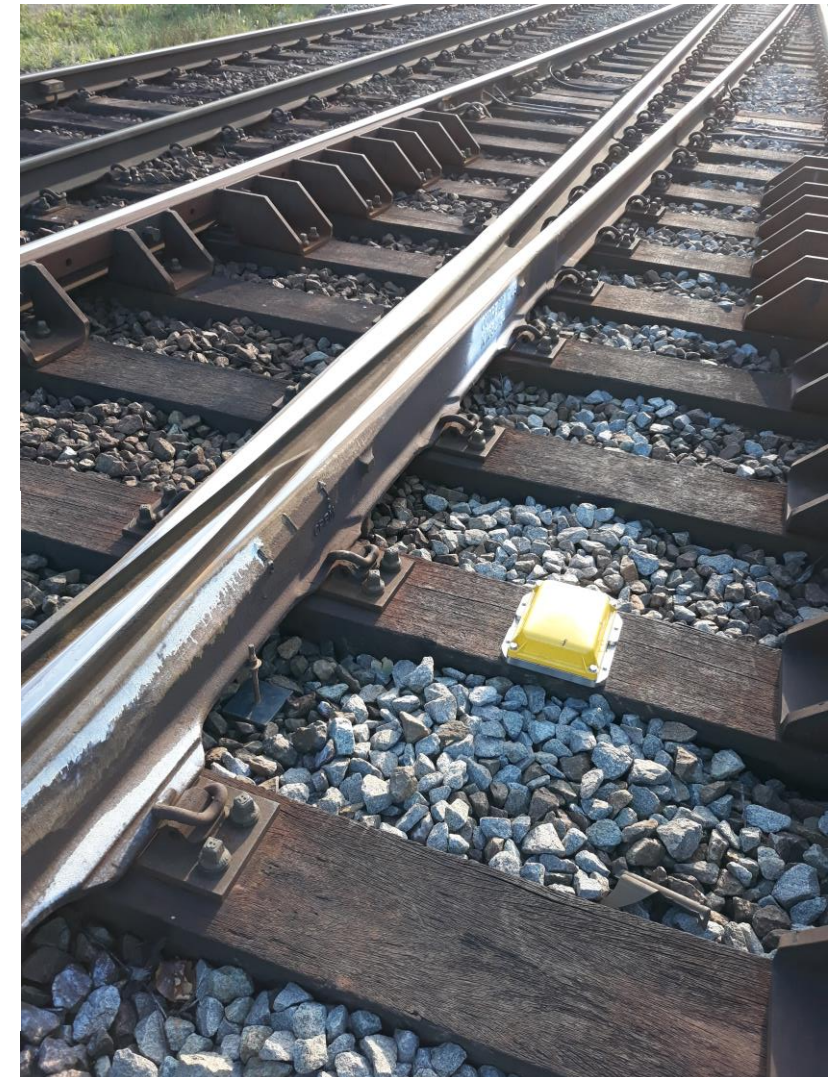
**1**

● Medium

**7**

● Unknown

**0**



# Installation

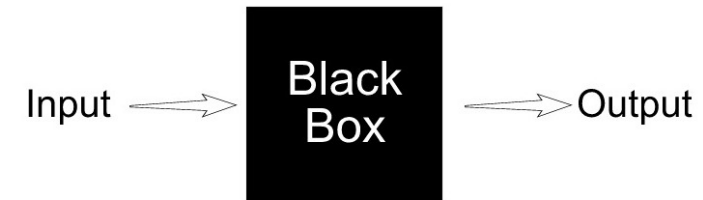
- 2 sensors per S&C
- System installation easy
- 20 sensors placed on 10 S&C





# Difficulties encountered

- Sensor is like a « black box »
- Growing pains of the system
- Sensor Platform is not incorporated into the Infrabel maintenance tool
- Difficulty to change people's habits



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# Results

- 38 manual tamping
- 2 tamping were efficient
- Any improvement

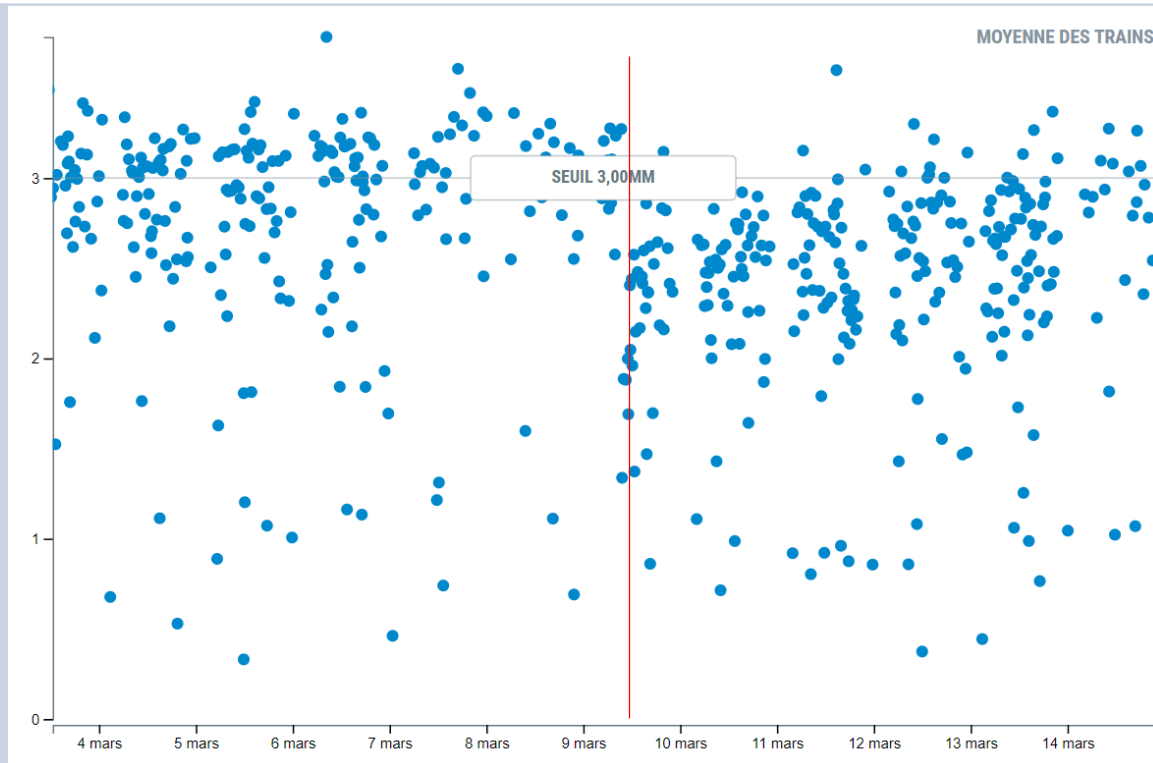




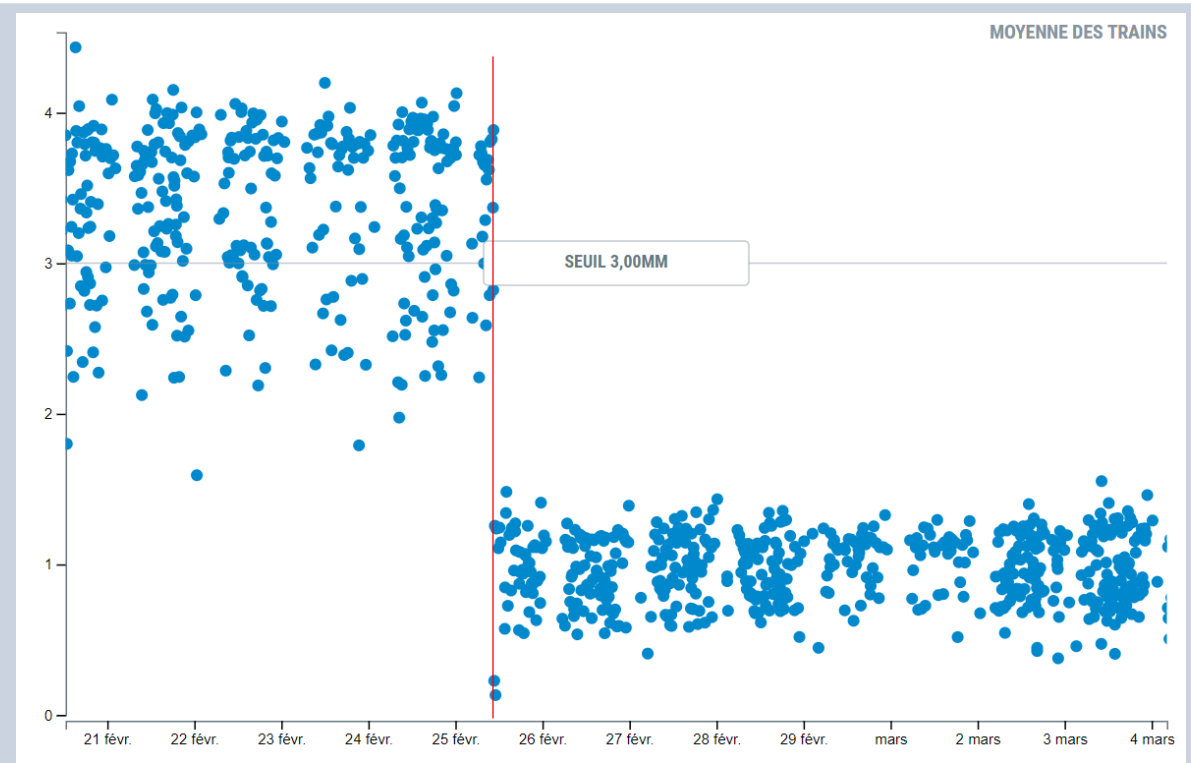
# What we've learned

- Manual tamping is not really efficient

## Unefficient manual tamping

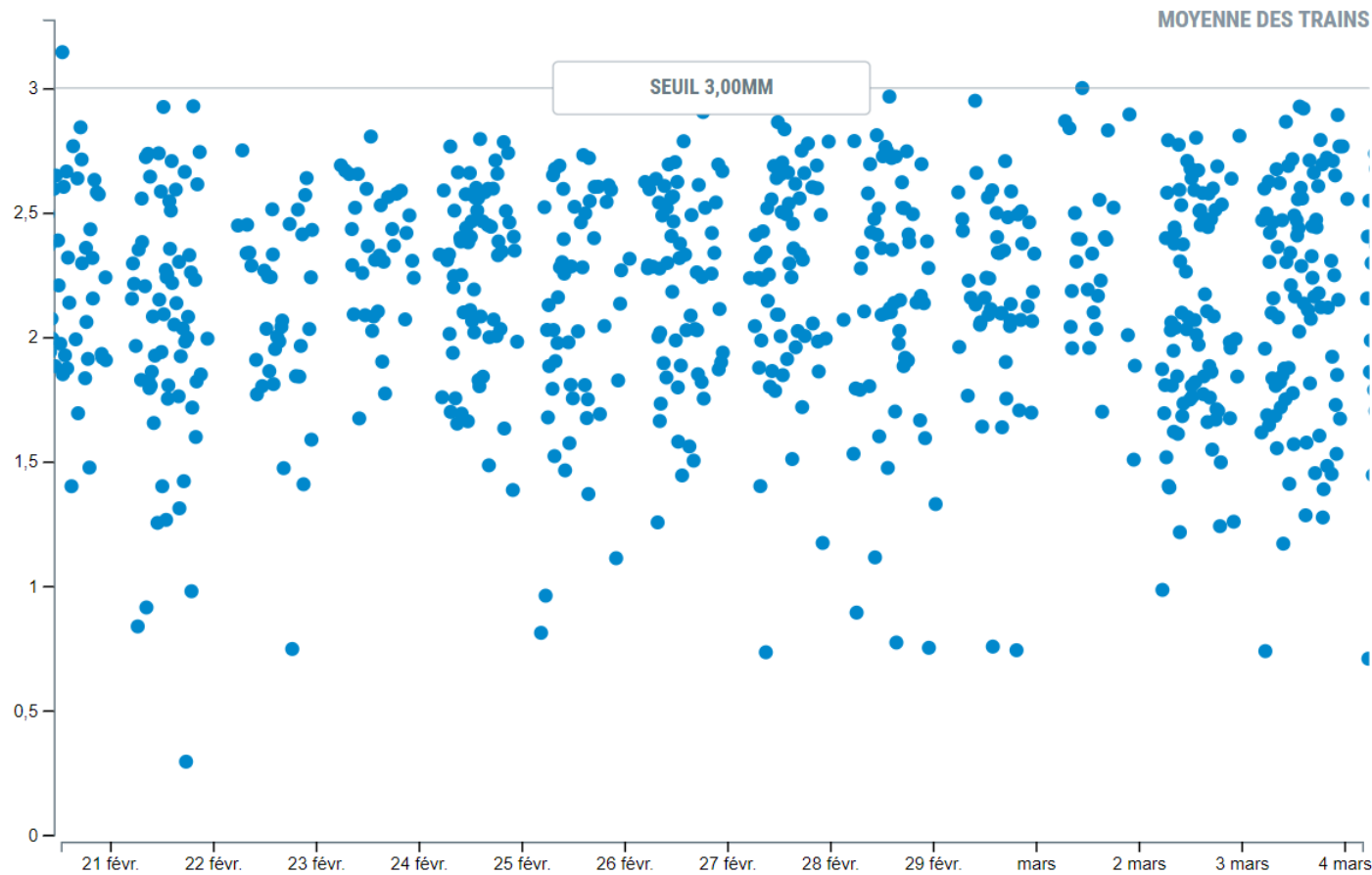


## Efficient manual tamping



# What we've learned

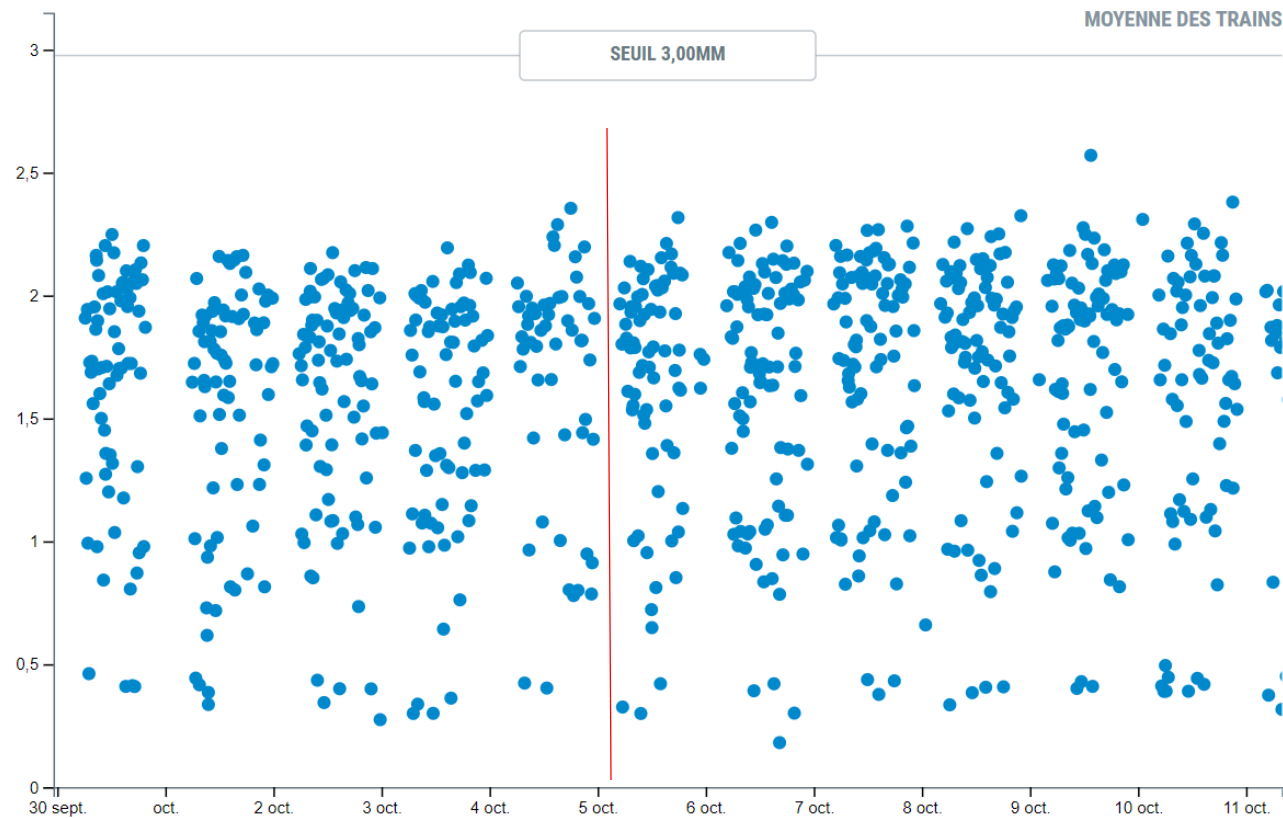
- Range of measurements during one day is large (3 mm)





# What we've learned

- Decision to initiate the maintenance is unjustified



# New approach

- Last five months : new approach
- Data analysis by a central team
- Only 3 tamping operations





# Conclusion

- Significant progress in the tamping process
- Reduce the tamping activities
- Several key success factors :
  - Operation only planned if threshold is crossed
  - Right teams to analyse the data
  - Outcome of the analyse integrated into the existing maintenance system
- Not yet decide to roll out
- Monitoring necessary for the future



**Develops**  
**Facilitates**  
**Bringstogether**

