

A holistic approach for the design and assessment of railway tracks

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Overview

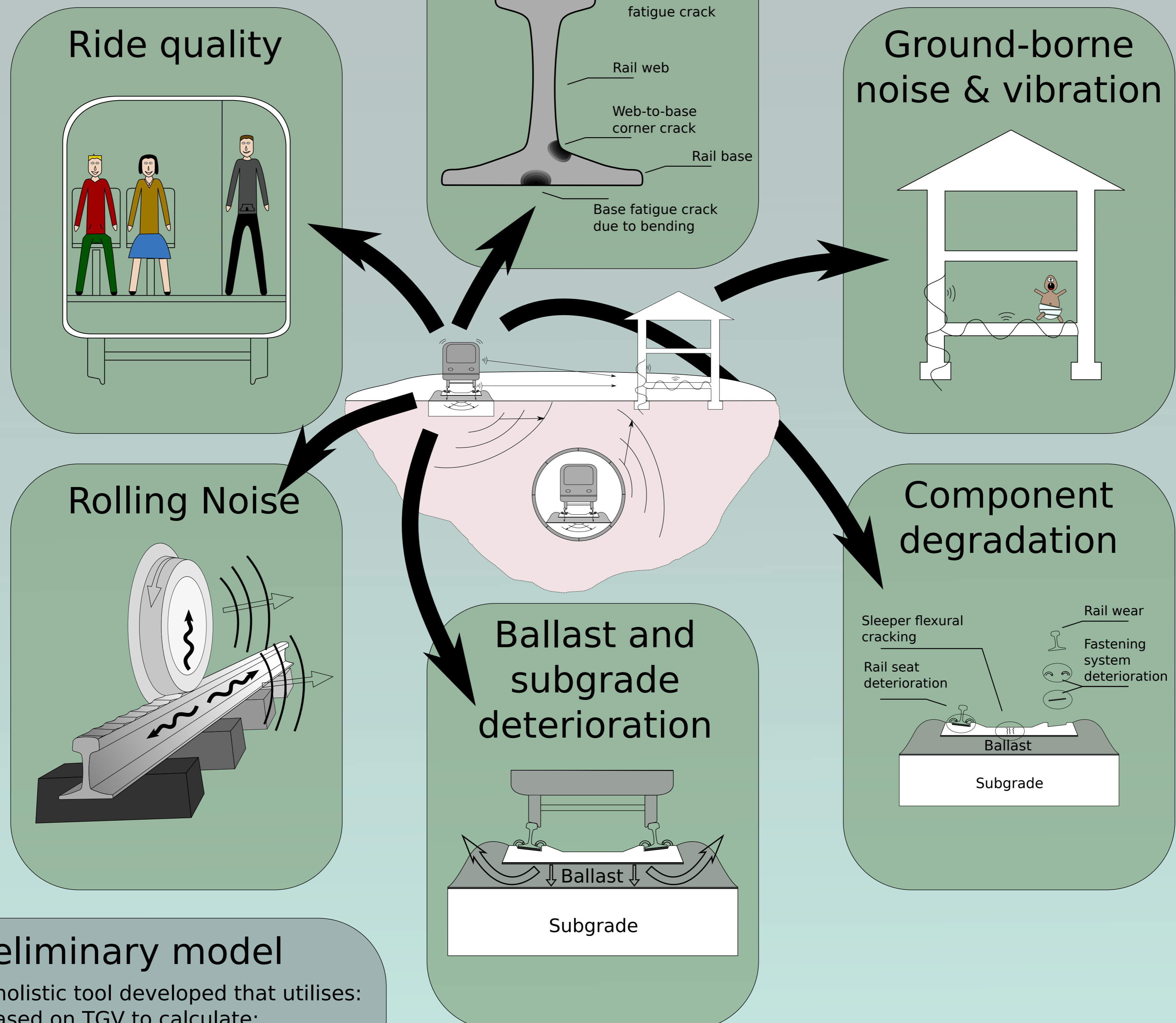
- Continuous investments are made worldwide in **railway infrastructure**
- The **performance of tracks** is crucial for the successful operation of the railway
- A lot of research has taken place for the **understanding of the performance** of various parts of the railway system
- Main focus has been given on **individual aspects** of the design

but

Changes that can benefit one aspect of the design, should be checked as they may have negative impact on others

Objectives

- Develop a tool that considers and integrates all aspects of track design
- Identify key parameters influencing track behaviour and performance
- Investigate the level of interaction of individual components and how they influence the specified indicators



Preliminary model

Preliminary holistic tool developed that utilises:

- A model based on TGV to calculate:
 - ground-borne noise and vibration by using empirical relationships for building response
 - ride quality by additional calculations of the vehicle response
- A model based on TWINS to calculate:
 - Rolling noise from wheel and track

Future work

- Implement additional indicators to preliminary model
- Conduct parametric study to identify key parameters involved in track behaviour
- Use multi-criteria optimization in order to find global optimum design