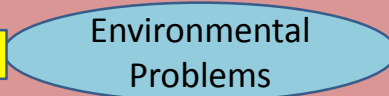


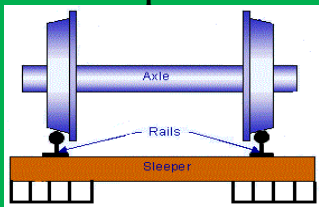
Motivation

- *High maintenance cost*
- *Huge CO₂ emission*
- *Early failure in the existing sleeper*



Our Solution: Composite materials + Optimisation

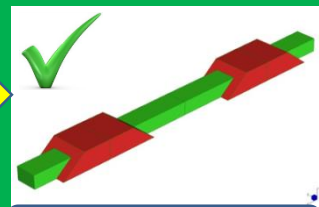
Composite = Eco friendly + No insect infection and chemical attack



Stress distribution



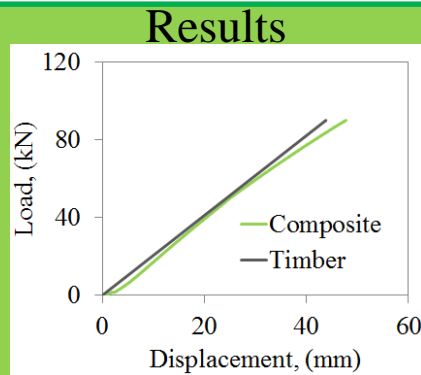
Traditional shape



Optimised shape



Sleeper test



Installation

Conclusions:

- Optimised shape reduces two-third volume of materials
- Composite sleeper behaviour is comparable with timber