Upgrading of railway lines is the economical way to support rail freight traffic. Some highlights are given below from a guideline from the EU FP7 Project Capacity4Rail

• Globally, new railway lines are built for high speed operations while existing lines are left for freight
• The existing lines were built for old traffic demands
• Railways now have to upgrade lines to meet new demands
• This is key to a modal shift of freight transports to railways within reasonable limits for economy, environment and time.
• There are challenges and limitations, but also possibilities to upgrade freight lines to improve performance!
• Upgrading guidelines based on research and development are lacking. This study fills this gap.
• The table below shows the influence improvements of different parts of the track has on upgraded operations.

The study is based on results of European projects now reaching TRL8 – TRL9.

### Substructure
Assess substructure conditions and effects of subgrade improvements.
Left: Tamping operations associated to sudden track stiffness variations. Right: Injections in an in-service track.

### Bridges
Work processes and most bridge types are described. A structured approach of upgrading to meet new demands is proposed.

Forsmo bridge in Sweden after strengthening from 22.5 to 30 tonnes axle load.

### Track and Switches & Crossings
Two–stage assessment of consequences of upgrading on increased deterioration including proposals for improved maintenance.

### Reference:

www.traconference.eu