



Rail System and Turnout Services

Inspection and testing

Diagnostics

Maintenance

Asset management

Delivery of standard Vignole-rail turnout



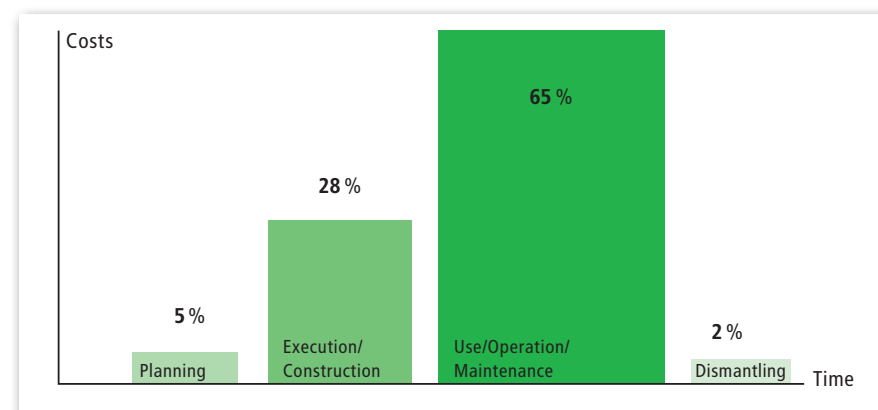
Asset management Rails and turnouts in the best possible condition

Rail network operators use the **asset management from Vossloh** to optimize their costs for rails and turnouts. In order to best exploit the long service life of rail networks, our asset managers ensure compliance with all the requirements and industry-sector-specific specifications for rail infrastructure.

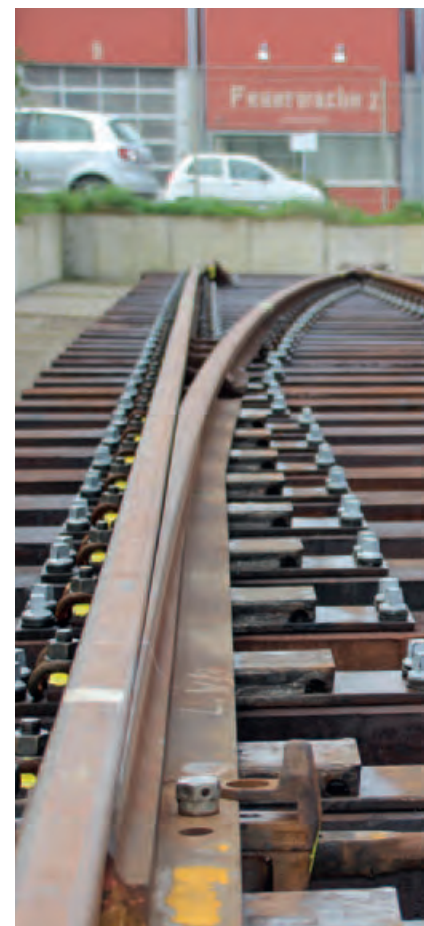
Our main focus is on economic efficiency. The **average life cycle costs from design, construction, operation and maintenance up to dismantling** show that the operating phase accounts for almost two thirds of total costs. This is exactly where our asset management comes in: to ensure cost-effective operation and, in the long run, your investment.

We also develop various other strategies in order to reduce the life cycle costs of rail infrastructure.

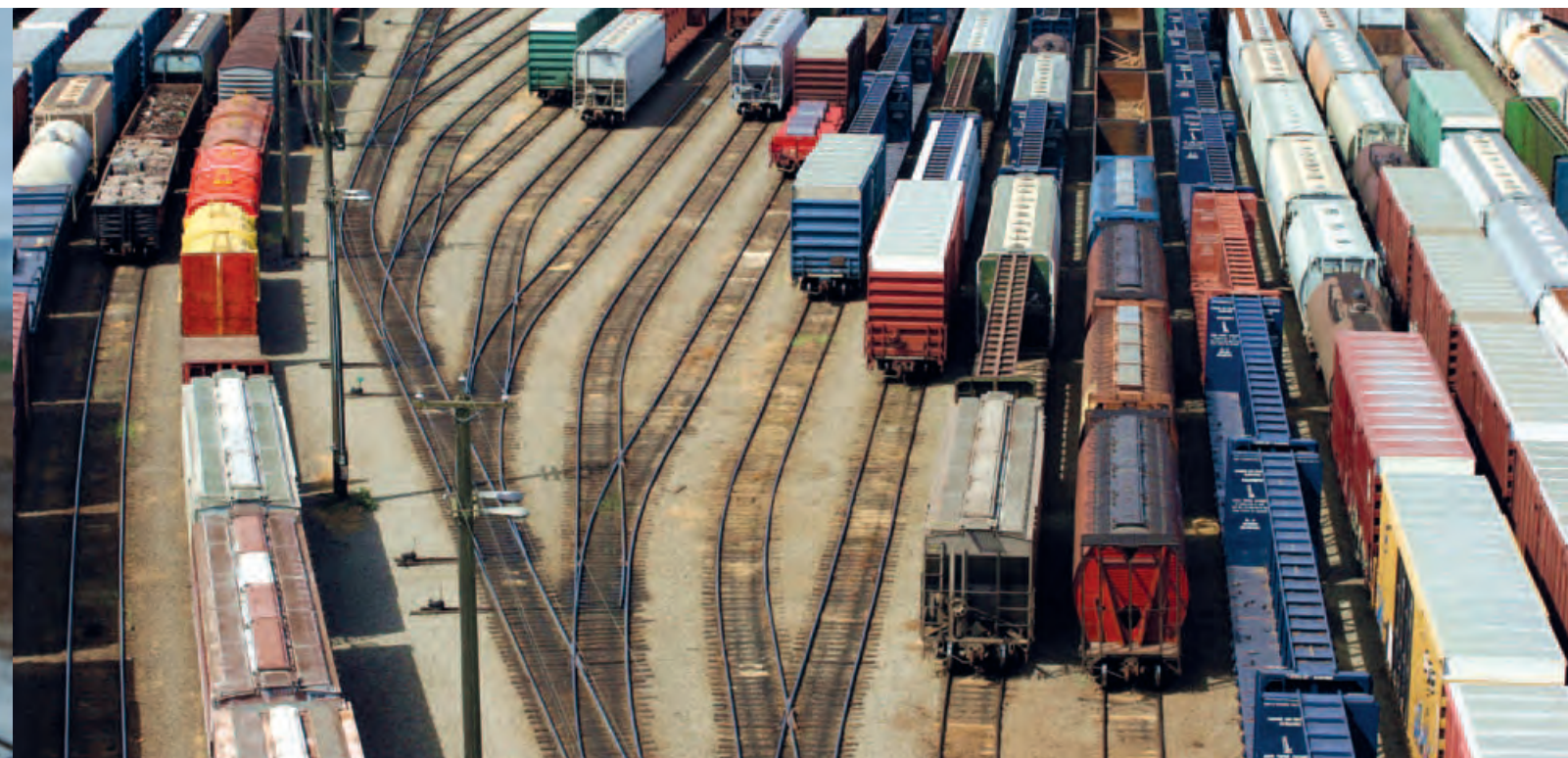
With its asset management as well, Vossloh stands for full service: from **taking measurements and testing all the way to repairs, parts replacement or even the complete installation of new switches**. We would be happy to show you our standard Vignole-rail turnout concept.



Typical allocation of costs in the life cycle of a railway system



Turnout installation in Dortmund



MAINTENANCE OBJECTIVE

- To provide rails and turnouts
- in the best possible condition
 - in the agreed availability
 - with optimum economic efficiency

Retaining value through maintenance

Operations account for around two thirds of a rail network's total costs, making an intelligent maintenance strategy the key to asset management. The right strategy prevents disruptions and downtime, extends the service life of the asset and ensures that operational safety standards remain high.

Expensive repair work and the replacement of large components, not to mention reconstruction, all incur enormous costs. The Vossloh Team knows from years of experience that if steps are taken at the right time, in most cases replacements are either unnecessary or not required until much later.

Ideally, design, system engineering and maintenance go hand in hand. Continually inspecting the rail infrastructure secures the necessary information to be able to manage the asset intelligently. This secures the investments for the long term and ensures safe operating schedules – and satisfied customers.



Vignole or grooved rail We handle both



The ideal mix: maintenance, service, repair and replacement

Both Vignole and grooved rails and turnouts may be extremely robust but they too are susceptible to the ravages of time.

Vossloh relies on two maintenance strategies:

1. With a **preventive maintenance strategy**, we place great emphasis on the perfect combination of components used in the design of the system, combined and installed by engineers and technicians with the best training.
2. With a **condition-based maintenance strategy**, regular inspections provide the latest data to aid in selecting the appropriate maintenance measures. The track systems are inspected, tested and measured using the latest technology.

Vossloh will of course handle any subsequent repairs, parts replacement and final installation of new rails and switches.



Measuring



Typical wear damage



Checking switches on a track system

MAINTENANCE STRATEGY

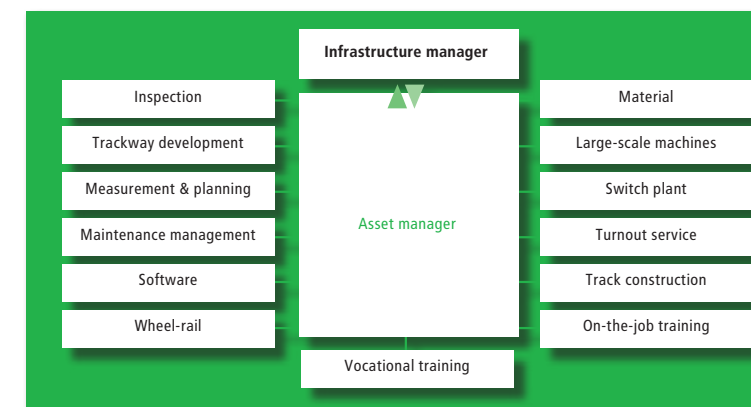
1. Definition of objective
2. Determining the asset value of the system
3. Establishing and executing maintenance procedures
4. Determining the structural status and asset value status of the infrastructure
5. Scheduling and management system:
 - Scheduling procedures
 - Long-term documentation
 - Establishing and evaluating the life cycle costs

Asset management – always customized to suit

At Vossloh, asset management is based on **clear, customer-specific cost objectives and clear agreements on asset quality**.

Our team of specialists remain in constant communication with the customer. The more transparent the maintenance process, the more efficient and economical the use of the track system.

The modular structure of Vossloh's asset management comprises everything from the determination of requirements, preparation of tenders, order monitoring and documentation to maintenance and complete asset management with full budget responsibility. Our services can be combined individually and customized to suit, and with the experience gathered over the years we can now offer a range of additional services. An example is the "temporary asset manager", who makes up for shortages in capacity and supports those responsible for maintenance with all the day-to-day tasks.



All the process steps of asset management combine to form an overall, transparent system.

Full Service for turnouts

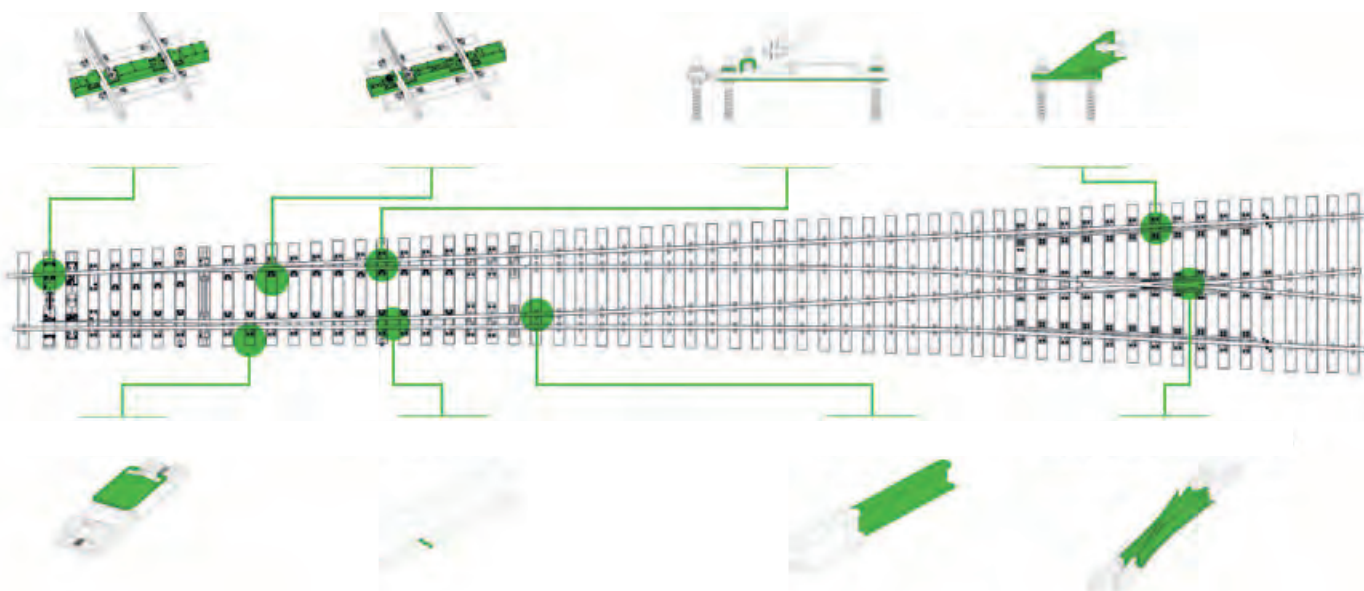
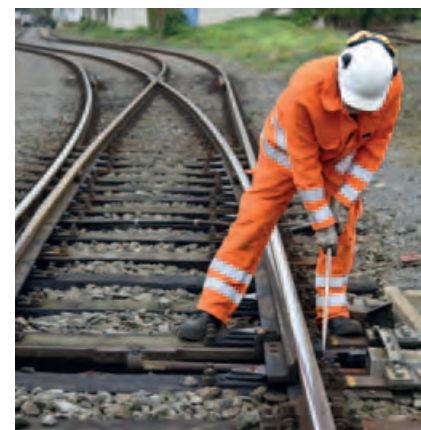


Turnouts need know how

High tech requires special care. Turnouts are the most demanding element in a track system. Their proper maintenance requires special expert knowledge and the maintenance procedures used are also more involved.

Complex system of turnouts. Due to their interfacing with control and signaling systems, grinding and welding processes, electrical engineering, track construction and turnout technology, turnouts generate costs many times that of rails. The specialist teams at Vossloh have the best possible training for working on turnouts.

Fast and local. For the most part, our specialist turnout teams operate fully independently, meaning that there are no waiting times for subsequent maintenance teams. Our comprehensive service network ensures we are close to our customers and at their service 24 hours a day, 7 days a week. Our wide range of replacement parts is also optimally equipped for any situation.



The three turnout inspection service categories

CHECK LIGHT

Information on the operational status (safety check)

- Plausibility check of the specifications
- Manual verification measurements of turnouts
- Visual inspection of turnouts
- Functionality check of the closure device
- Determining the operational condition of the turnout
- Documenting procedures in the turnout inspection card

CHECK PLUS

In addition to the CHECK LIGHT module, a basis for condition-based turnout servicing and infrastructure data management

- Complete inventory of master data (design, specifications etc.)
- Condition-based and needs-based repair scheduling according to the asset's importance and the damage priority
- Visual evaluation of condition using checklists
- Digital verification measurements of turnouts
- Recommendation for removing the cause of the defect
- Classification of defects according to their relevance for safety
- Digital documentation and print-out
- Evaluation of all master data and inspection results in table form
- Documentation as a service life record

CHECK MAX

In addition to the CHECK LIGHT and CHECK PLUS modules, the ideal basis for economical and efficient maintenance management

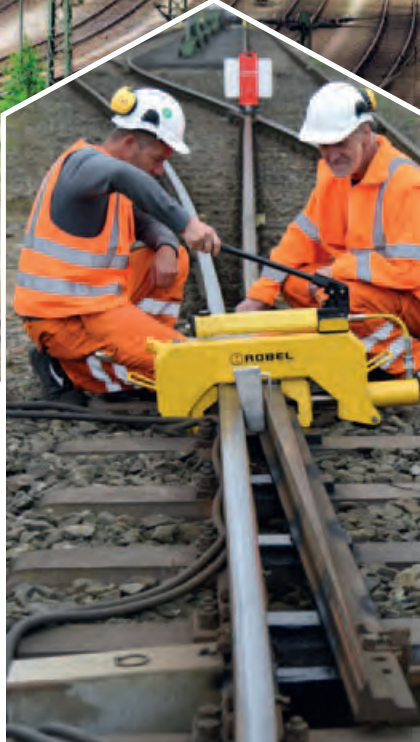
- Classification of the asset
- Photos of the most important defects
- Advanced statistical evaluations:
 - Frequency distribution of the results (asset-relevant and defect-category-relevant)
 - Summary for decision-makers

Our six maintenance modules for turnouts



Closing and drive mechanics

Mounting, adjusting and removing drives and closing mechanisms
Performing maintenance, cleaning and inspection
Installing and removing securing bolts
Creating special solutions



Straightening

Straightening point blades
Correcting horizontal and cross level defects
Straightening derailment damage



Measuring

Measuring gauge, flangeway gap and guiding distances
Measuring gauge face distances
Determining cross and horizontal levels
Determining switch and crossing geometries
Recording closing mechanism and drive dimensions
Determining the switching force
Profile measurements, UT, ET



Welding work

Rail joint welds
Resurfacing using welding
Using welds to repair damaged areas
Welding on guard rails and points blades



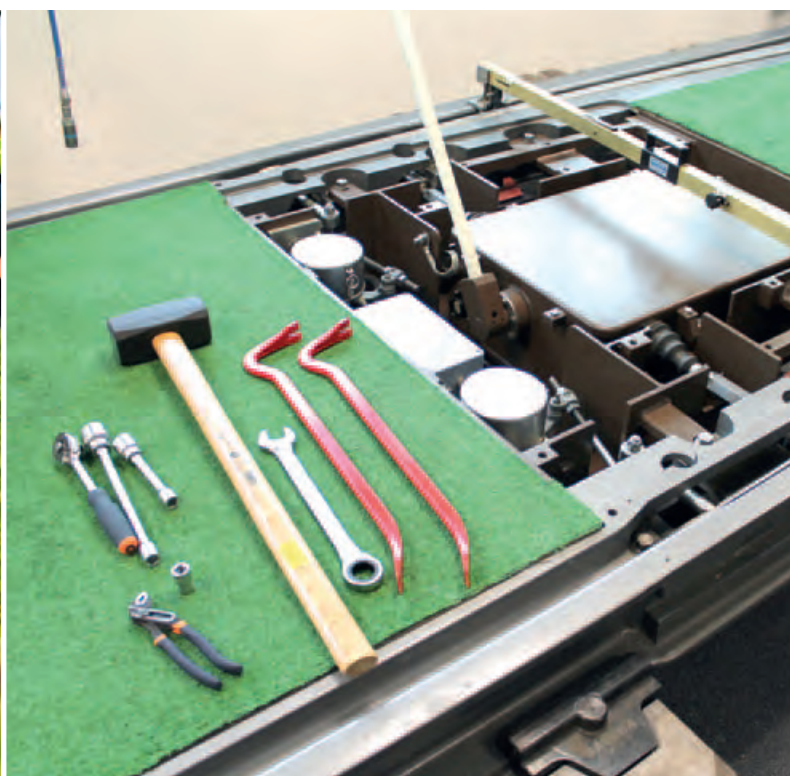
Grinding work

Re-profiling blades and rail cross sections
Removing burrs and laps
Using grinding to repair damaged areas and frogs
Grinding out ripple formations



Track and trackway

Correcting gauge, flangeway gap and guiding distances
Reestablishing gauge face distances
Treating track fastenings
Replacing large turnout parts
Performing tamping work
Clean-up



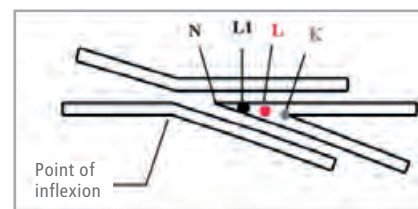
The best people for switches – through target-oriented special training and on-going networking

At Vossloh, specialist personnel with the best vocational and on-the-job training take care of all aspects of turnout maintenance. This standard of quality ensures a reliable diagnosis of the condition of the turnout, smooth maintenance, as few disruptions as possible to normal rail operations and, ultimately, satisfied passengers.

With comprehensive **internal and external vocational and on-the-job training**, we make sure that all our employees are familiar with the latest technology.

Since there is no special vocational training for repairing turnouts, Vossloh uses a special training concept: **WFACH**.

Together with general know-how in the field of inspection and maintenance, this concept teaches special techniques for use on that most demanding element in any track system: the turnout.



Points of measurement on a basic frog



Top expertise thanks to the WFACH vocational training concept

There aren't only experts working at Vossloh. We also train the next generation of experts.

External internship

WMECH switch mechanic for the DB AG

- Taking measurements using mechanical and electrical measuring equipment
- Taking current, voltage and resistance measurements on switch drives
- Connecting and disconnecting drives
- Visually inspecting turnout heating
- dv-based inspection as per RiL 821.2005
- Securing rail breaks
- Rectifying small defects

Welding internship at the SLV for

- Flame cutting
- Resurfacing track using arc-welding
- Joining track using arc-welding
- Track joint welding using self-shielded flux core wire
- Aluminothemic fusion welding

Internal internship

- VDV guidelines/directives
- Grooved rail turnout technology
- Vignole turnout technology
- Occupational safety
- Switch inspection
- Switch signals
- Grinding-based repair methods
- Mechanical/autogenous straightening of points blades
- Final assembly of turnouts

Find out about
our other rail
maintenance
services:

vossloh



**Factory-based
Rail Production Services**

Long rail manufacturing
Rail transition points and insulated joints
Profile processing
Logistics

vossloh



**Rails perfectly
maintained**

High Speed Grinding
High Performance Milling
Flexis System

vossloh



**Co-ordinated
Perfectly**

Loading & Logistics:
Transporting and loading rails and turnouts
Construction site logistics

vossloh



**Perfectly connected
on the move**

Welding on the route
Mobile welding factory
Rail replacement

vossloh



**Always ready for the track:
Asset Management**

Rail Inspection
Data Processing
Availability Management
Training and Consulting