



RAIL SERVICES

Your way to AVAILABILITY

TRANSPORT SYSTEMS
TRAINS
BUSES
SIGNALLING
COMPONENTS
SERVICES

Your Way
to Future Mobility

www.caf.net

EXTENSIVE EXPERIENCE MAINTAINING TRAINS

WE ARE MANUFACTURERS
WE ARE MAINTAINERS
WE ARE DIGITAL



CAF was founded more than a hundred years ago. Today we are an international market leader in the design, manufacture, maintenance and supply of equipment and components for mobility solutions. We are worldwide known for our versatility, flexibility and readiness to adapt to customer needs.

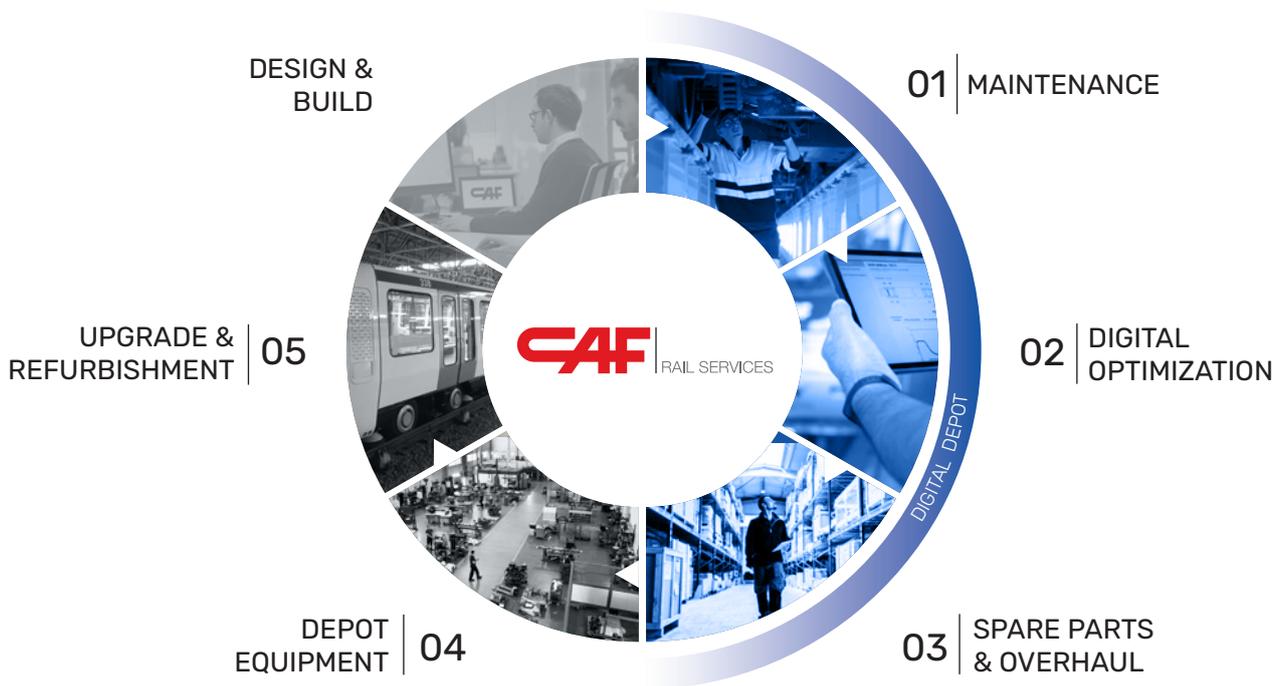
BEING PART OF A LARGE GROUP MAKES IT POSSIBLE

CAF Group comprises over 100 companies that together offer a global mobility solution. CAF's experience throughout all five continents and compliance with international standards, has resulted in a "total quality" approach to every project.

RAIL SERVICES PORTFOLIO

In the context of service, CAF group has developed a wide range of new services which aims to ensure:

- | Reliability and availability
- | Maintenance costs reduction
- | Vehicles life extension
- | Ensure safety



YOUR WAY TO AVAILABILITY

Any Technology
Any Manufacturer
Any Mobility Solution

CAF has a proven track record in maintenance and after-sales activities, obtaining optimal values of reliability, availability, maintainability and safety during operation. This experience not only applies to trains manufactured by CAF, but also to any kind of rolling stock from other manufacturers.

The wide range of services covers any additional customer requirements, such as driver and maintenance personnel training, maintenance engineering support, incorporation of latest technological solutions, modernisation of rolling stock and comprehensive spare parts management service.



RELIABILITY AND AVAILABILITY



REDUCE MAINTENANCE COSTS



EXTEND VEHICLE LIFE CYCLE



OPTIMIZE THE SAFETY/ COST COMBINATION

SMART MAINTENANCE

As a key enhancer for availability and passenger comfort.

By accumulating knowledge and analysing the data the diagnosis and reaction times are improved, avoiding delays or impact to the passenger maximizing capacities and gaining agility.



WORLDWIDE PRESENCE

MORE THAN

100

FACILITIES

MORE THAN

4,000

HUMAN WORKFORCE

GIVING SERVICE TO MORE THAN

10,000

CARS

A SEAMLESS PASSENGER EXPERIENCE

OPTIMIZED PLANNING AND MANAGEMENT

Streamlining work orders management and team. Work on the vehicles can be planned and prioritised based on real-time data.

AVOID REPETITIVE FAILURES

Prioritizing the equipment and / or trains. Easily track reliability performance per train, system and type of alarm.

EASING DIAGNOSIS

Detection of hidden failures by analyzing anomalous behaviors in variables and alarms.

DATA INTEGRATION

Automatic daily centralization of alarms and variables for a better diagnosis of the asset condition.

DIGITAL DEPOT & OPERATIONAL EXCELLENCE

A data centric revolution for a Connected Mobility Experience.



SMART OPERATION CENTER FLEET MANAGEMENT

- Telemetry
- Geolocation
- Real Time Alarms
- Equation Editor
- Remote HMI
- Analytics for Operators



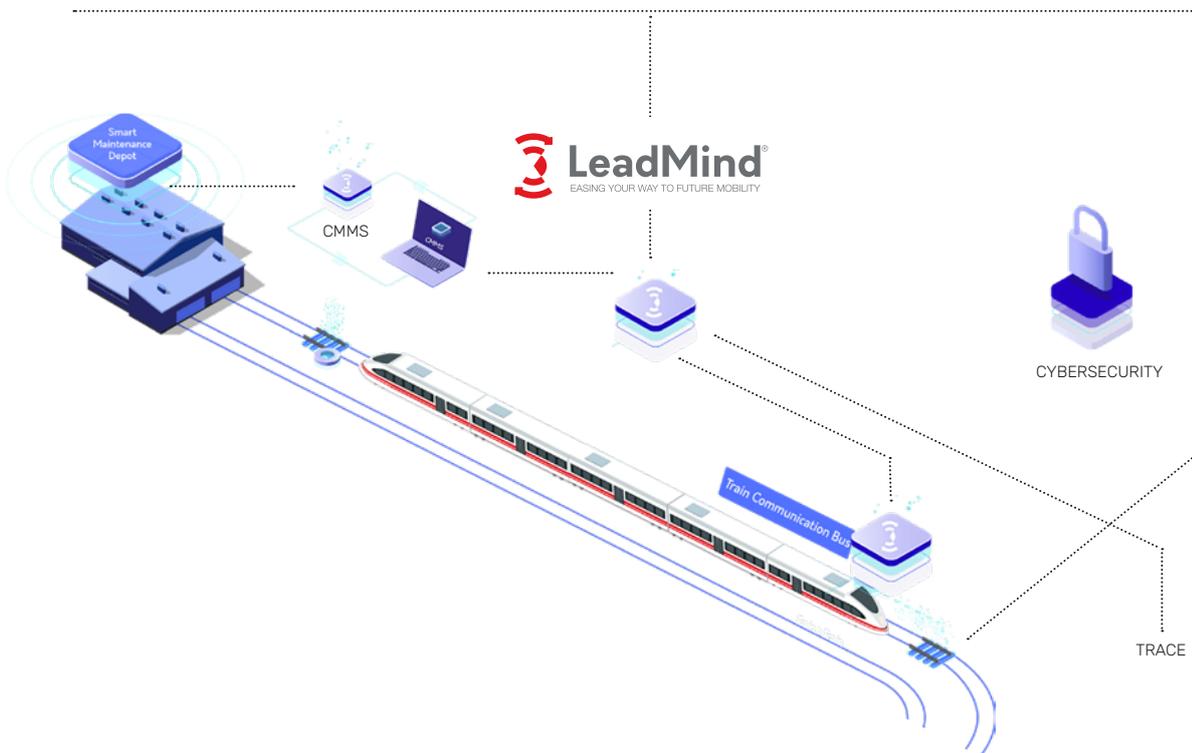
ANALYTICS BACK OFFICE ADVANCED ANALYTICS

- Life Indicator
- CBM
- Predictive Maintenance
- Wheelset Life Extension
- Drill Down
- Explore & Diagnosis



INSPECTION STATION WAYSIDE SYSTEMS

- Wheel Inspection
- Brake Inspection
- Collector Shoe Inspection
- Visual Inspection: Bogie, pantograph



FLEET OPERATIONAL EXCELLENCE

ENERGY EFFICIENCY

- Driver's Performance
- DASEM
- Energy Advanced Analytics

PASSENGER EXPERIENCE

- Passenger Counter
- Connected Pass. Information System

SAFETY

- Wheel Slide Protection
- Sliding condition
- SW Release control
- Speed Monitoring

SCAN TO VISIT
OUR CHANNEL



OWN TECHNOLOGY DEVELOPMENT

DEPOT PERFORMANCE

FROM DATA TO ACTION



DATA DRIVEN DIGITAL
PLATFORM



ON-BOARD AND WAYSIDE
HARDWARE FOR DATA ACQUI-
SITION

AGILE STOCK MANAGEMENT



3D PRINTING OF SPARE PARTS



MOBILE APP WITH BARCODE
(WAREHOUSE MANAGEMENT)

PLAN AND OPTIMIZE



ADVANCED MAINTENANCE
EXECUTION SYSTEM

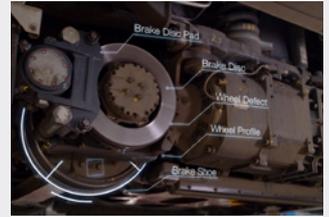


MAINTENANCE PLAN
MANAGEMENT PLATFORM

WHEELSET LIFE EXTENSION



AUTOMATIC WHEEL PARAMETER
MEASURING EQUIPMENT



WHEEL ADVANCED
ANALYTICS

SMART ASSET MANAGEMENT



RFID TRACEABILITY PDA

MAINTENANCE SERVICES

We take care of the vehicle, so you can take care of passengers.

CAF operates the most innovative maintenance and optimisation technologies to maximise train quality of service parameters and reduce life cycle costs.

FLEET MAINTENANCE

LIGHT MAINTENANCE

- | Predictive Maintenance
- | Preventive Maintenance
- | Corrective Maintenance

HEAVY MAINTENANCE

- | Overhaul with improvement upgrades and modifications



TOTAL CONTROL OF THE FLEET HEALTH STATUS

Plan and optimize the maintenance before the train arrives to the depot.

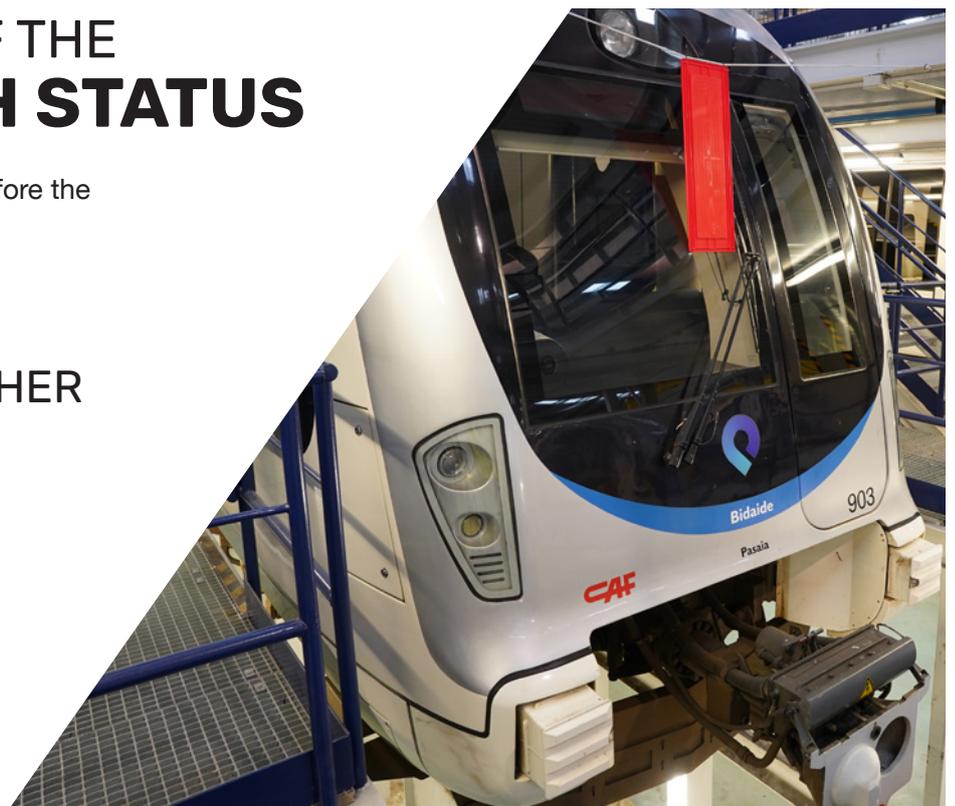
WE ALSO ADAPT TO OTHER TYPES OF SOLUTIONS

TSSSA - TECHNICAL SUPPORT & SPARES SUPPLY AGREEMENTS

- | Light Maintenance
- | Heavy Maintenance

TECHNICAL SUPPORT

- | Technical Assistance
- | Training
- | Obsolescence



DIGITAL OPTIMIZATION

Comprehensive solutions for your fleet management through advanced analytics.

A new generation of digital solutions with a single objective: get the best performance from your fleet and your maintenance strategy. Welcome to a powerful combination of Data Analytics and Engineering expertise.

ANY VEHICLE, ANY MANUFACTURER.

CONNECTED WITH YOUR CMMS, DATA IS YOURS.

CLOUD-BASED. EASY TO SCALE-UP.



WE FEEL YOUR CHALLENGE AS OURS LEADMIND ROI ACHIEVEMENT

16-21%

PRODUCTIVITY
INCREASE

10%

COST REDUCTION
OVER BUSINESS PLAN

10-35%

FAILURE DIAGNOSTICS
TIME REDUCTION

15-25%

REPETITIVE FAILURES
REDUCTION

1-10

SERVICE INCIDENTS
AVOIDED

2-6%

ENERGY CONSUMPTION
REDUCTION

A leading data platform for smart dynamic maintenance and higher operational efficiency.

FLEET MANAGEMENT

REAL TIME DATA FOR A SEAMLESS PASSENGER EXPERIENCE.

Ensure operational excellence and reduce the impact of service affecting incidents.

REAL TIME INFORMATION

- 1 | Passenger Counter
- 2 | Remote HMI
- 3 | Telemetry
- 4 | Geolocation
- 5 | Equation Editor
- 6 | Passenger Comfort

- | Units in Service
- | Passengers On Time
- | Breakdowns Anticipated



ADVANCED ANALYTICS /CBM

EASIER THAN EVER. PLAN THE UNPLANNED.

Predictive maintenance for a safe and efficient operation. Improve availability, reduce over maintenance and life cycle cost.

SMART OPERATIONS

- 1 | Safety: Speed Monitoring/ Sliding Map
- 2 | Energy Efficiency: Catenary Voltage

SMART MAINTENANCE

- 1 | Reliability: Drill Down, E&D
- 2 | Availability: Predictive Maintenance
- 3 | Process Automation:
Automatic Work Orders, Digital Logbook, Guided maintenance, Trace.

- | Improved Availability
- | Improved Reliability
- | Reduced Life Cycle cost



WAYSIDE SYSTEMS

YOUR INSPECTION STATION, YOUR WAY.

Modular Automatic Wayside Systems for Failure detection and wear monitoring.
Modular Integration capabilities with different systems and manufacturers.

- 1 | WHEEL Inspection
- 2 | BRAKE Inspection
- 3 | BOGIE Inspection
- 4 | PANTOGRAPH Inspection
- 5 | CAR Inspection

- | Automate measuring
- | Gain safety and efficiency
- | Gather all data centralized and integrate with WO



SPARE PARTS AND OVERHAUL

Distribution and supply of spare parts and components for railway vehicles throughout the world.

AVAILABILITY OF MATERIALS FOR MAINTENANCE SUCCESS

We provide solutions for spare parts and components, as well as for your supply chain management to ensure availability that enables operators and maintenance providers to optimize cost of ownerships.



SUPPLY AND MANAGEMENT

PARTS AS A SERVICE

Contracts for the supply and management of spare parts with flexible financing.

SUPPLY OF ALTERNATIVES

Supply of alternatives to improve key aspects of availability while optimising costs.

Experts in bogie parts: wheelsets, gearboxes, primary and secondary suspensions, mechanical parts, bearings, etc.

FRAMEWORK OR TAILOR-MADE CONTRACTS

Contracts adaptable to the specific needs of each operator and maintainer (preventive, corrective and accidents and vandalism) with material in stock and/or consignment warehouses.

SPARE PARTS ON DEMAND

Day-to-day management of specific material needs with high customer orientation through our Customer Service.

CUSTOMISED SPARE PARTS KITS

Customised and recommended kits for the optimisation of the maintainer's operation, reducing non-essential actions in the customer's process.



OVERHAUL OF EQUIPMENTS AND COMPONENTS

LIFE CYCLE MAINTENANCE

Overhaul work on bogies, wheelsets, gearboxes, brake systems and couplings.

IMPROVEMENT AND MAINTENANCE OF ELECTRONIC EQUIPMENT

Maintenance, repair, overhaul, increased reliability and electronics obsolescence management.



DEPOT EQUIPMENT

Highly efficient depots based on maintenance expertise.

Through a highly specialised team in maintenance processes and the integration of equipment with rolling stock, we deal with projects ranging from turnkey projects for complete workshop equipment, to the supply of equipment focused on optimising bogie maintenance operations.

TURNKEY PROJECTS

With our expertise, we tackle turnkey projects from the earliest stages involving the workshop layout, ensuring the correct integration between equipment and rolling stock fleets, through to the complete supply and start-up of the workshop.

DEPOT EQUIPMENT

Our extensive first-hand experience in bogie maintenance has enabled us to identify and develop the right type of equipment to obtain the best results. On the one hand, we develop and produce test benches and, on the other, we have created partnerships with leading manufacturers with whom we co-develop solutions that solve the challenges faced by the maintainers.

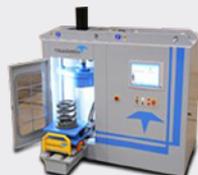


EXPERTS IN BOGIE MAINTENANCE

COMPETENCE FOR BOGIE TESTS



BOGIE TESTING /
ADJUSTMENT PRESS



BOGIE COMPONENT TEST
BENCH

WHEELSET MAINTENANCE COMPETENCE



UNDERFLOOR LATHE



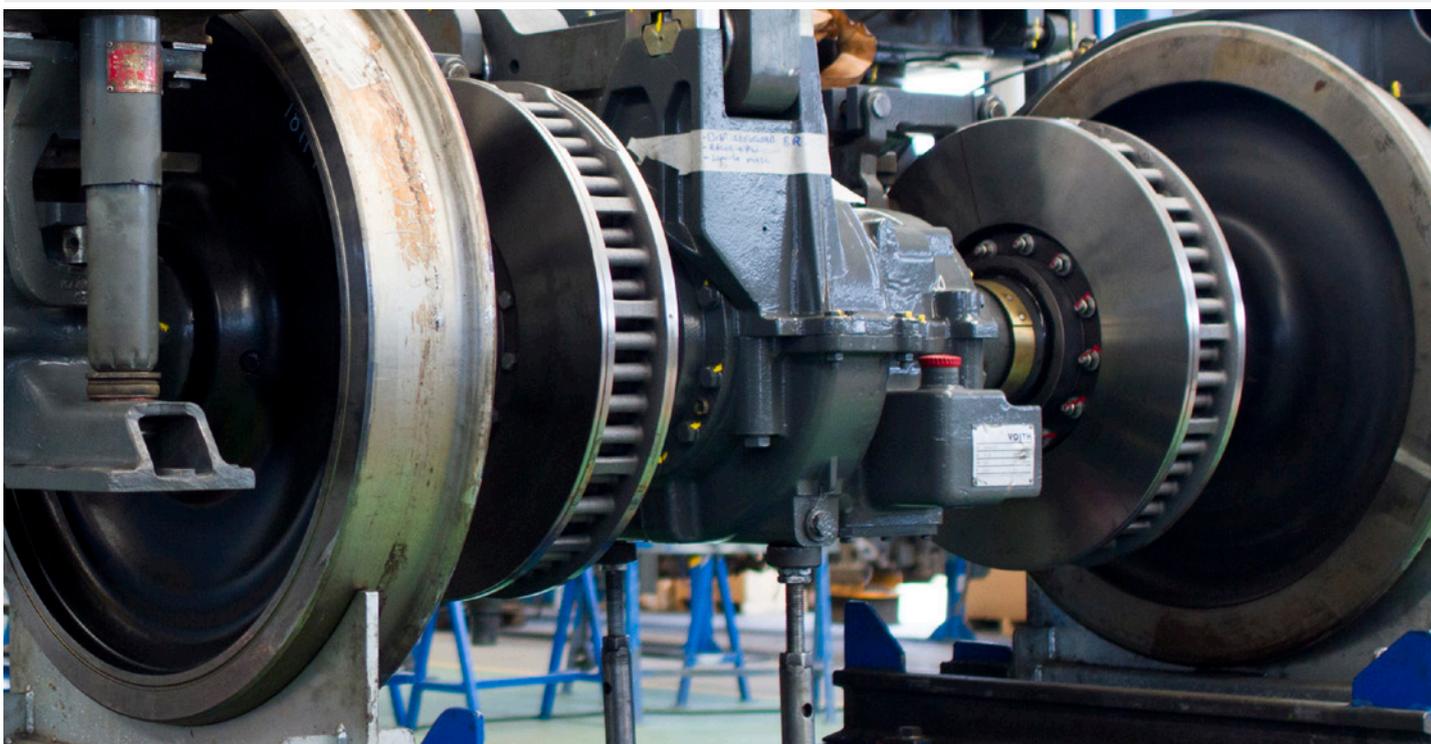
HORIZONTAL LATHE



WHEELSET PRESS



VERTICAL LATHE



MODERNIZATION & REFURBISHMENT

Level up the experience and add comfort to passengers.

CAF draws on extensive experience of railway vehicle maintenance and refurbishment to offer modernization and upgrading services tailored to each fleet and context.



- Signalling Systems
- Traction Systems
- Auxiliary Systems
- Bogies - Wheelsets - Gearboxes
- TCMS / VCU Systems
- Infotainment including PIS / PAS / PES and Wi-Fi
- Other Systems as CCTV, HVAC and Doors
- Vehicle Re-Styling
- Project Feasibility Studies and Costing
- System Engineering
- Industrial Engineering Including Localized Manufacturing
- Testing and certification
- After_Sales Services
- Maintenance



SUSTAINABILITY

VISION

Aligned with CAF's sustainability vision, this unit aims at extending the life of all kinds of already existing rolling stock by integrating cutting edge technology and improving the end user experience.



ONE STOP SHOP

- | After sales service
Warranty, maintenance & spare parts supply
- | Systems auditing
Health assessment on vehicle systems
- | Systems integration
Reverse engineering for upcoming systems
- | Modernization process
Industrialization, quality assurance
- | In house technology
Integration of Caf products in existing rs

AVAILABILITY & RELIABILITY

- | Propulsion systems:
 - Chopper.
 - GTO to IGBT
 - DC to AC
- | TCMS – HMI - Remote diagnosis
- | Brake and air generation systems

OPERATING EFFICIENCY

- | ETCS signalling system
- | Headway reduction
- | Catenary free operation
- | Dual and multi-system modes

COMFORT & AESTHETICS

- | Infotainment (CCTV, PIS-PAS-PA)
- | HVAC systems
- | Door systems
- | Interior design (lights, floors, pannels...)

LIFE EXTENSION

- | Mid-life-overhaul
- | 20 years life extension



HEADQUARTERS
J.M. Iturrioz 26
20200 Beasain, Gipuzkoa
Spain

SCAN TO VISIT
OUR CHANNEL

