



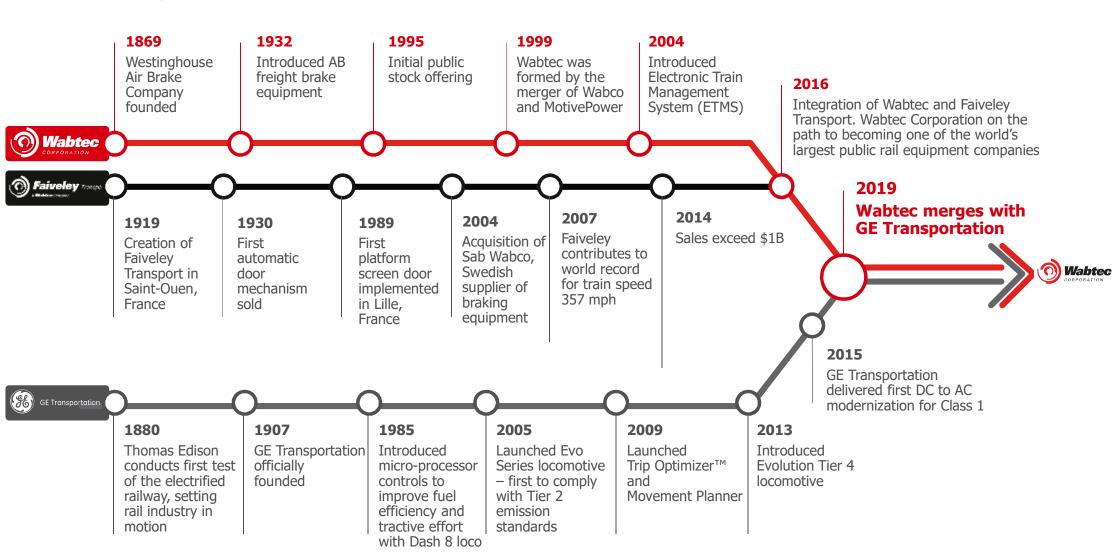
The **Wabtec Group**, whom Faiveley Transport belongs to, is a Locomotives and Railway Equipment Manufacturer with HQ based in USA. An international group present in all continents (30 countries) with about 20 000 employees.

Faiveley Transport (26 countries – 12 000 employees), which manages the Transit Segment, i.e. all the activities related to trains for passengers, is based in France (Genevilliers – Paris Area). With a business line focused on the rail industry, Faiveley Transport is organized in 4 groups: Energy, Comfort & Access; Brakes & Safety; Friction & Power Collection; Transit Services. Its industrial capacity and recognized expertise in Engineering, Project Management and testing validation have resulted in the market's broadest offering. It provides innovative applications to meet evolving expectations.

Faiveley Transport Italy is the Centre of Competence "Brake Control and OnBoard Singnaling" in the Faiveley Transit, Brakes& Safety Organization.

Wabtec Group

Nearly four centuries of collective innovation





27K
EMPLOYEES

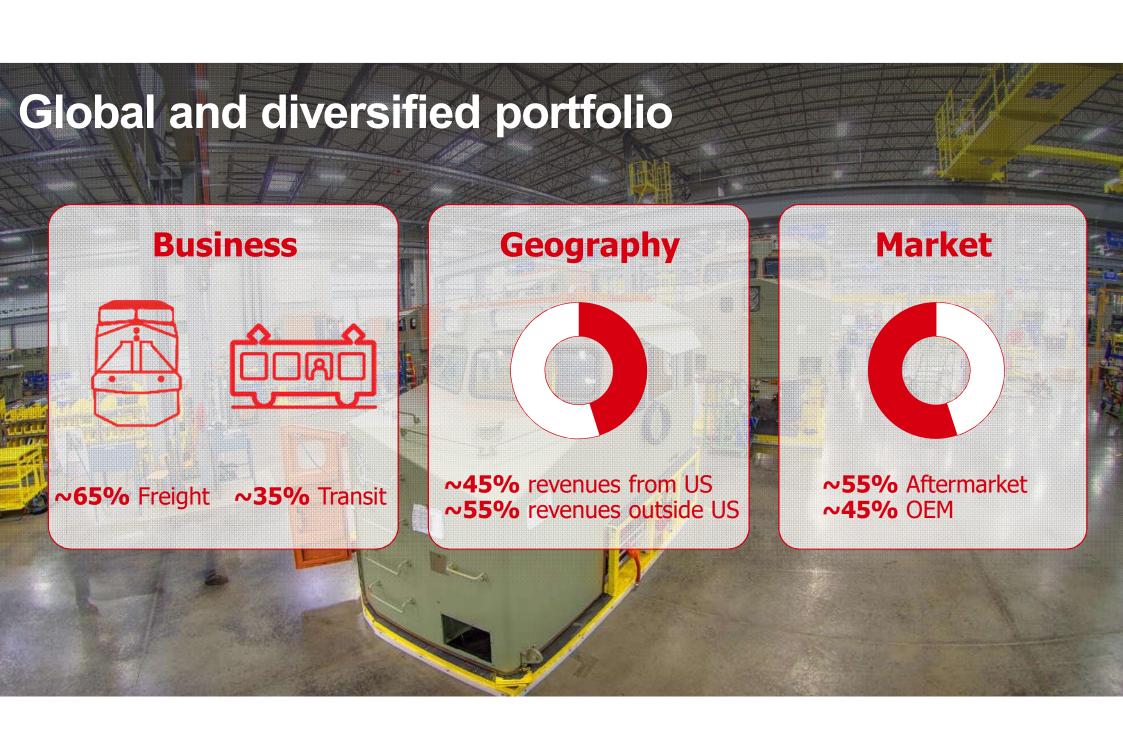
50
COUNTRIES

\$8B
REVENUE

FORTUNE

500

COMPANY



WABTEC Transit Segment Brake & Safety Group — Europe Business Unit

B&S Europe

Geographical View



FT Amiens

Employees: 372 Sales 2018: 112 M\$ Budget 2019: 135 M\$



FT Schwab

Employees: 80 Sales 2018: 23,7 M\$ Budget 2019: 28 M\$



FT BRAKES ITALY

FT Piossasco

Employees: 506 Sales 2018: 158 M\$ Budget 2019: 180 M\$

Poli SRL

Employees: 105 Sales 2018: 18,7 M\$ Budget 2019: 18 M\$

Vapor Europe

Employees: 34 Sales 2018: 7800 K\$ Budget 2019: 12 M€





Confidential & Proprietary



FT GERMANY FT Witten

Employees: 332 Sales 2018: 163 M\$ Budget 2019: 150 M\$

FT Nowe

Employees: 41 Sales 2018: 7,5 M\$ Budget 2019: 10 M\$



Wabtec MZT

Employees: 298 Sales 2018: 18 M\$ Budget 2019: 19 M\$





Employees: 54 Sales 2018: 11,8 M\$ Budget 2019: 12 M\$

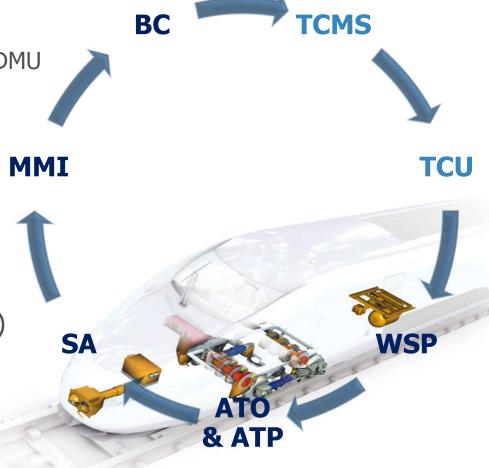


Brake and Safety

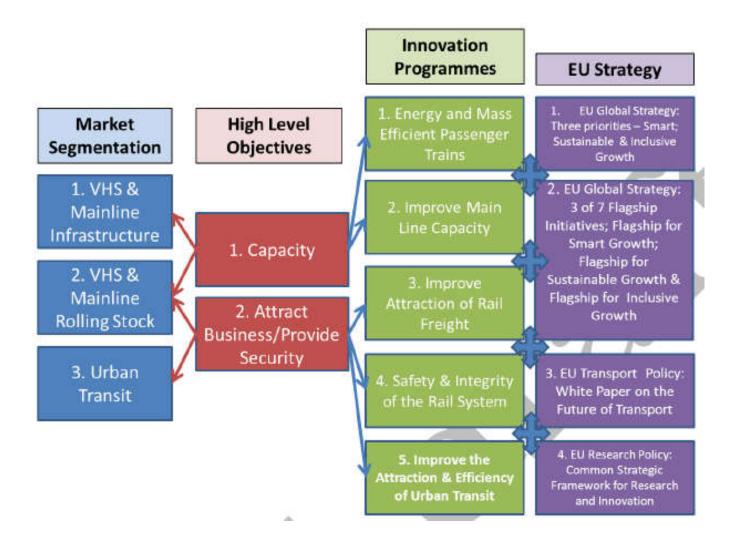
Competence Centre

 Brake Control cover all market segments (Metro, High Speed Train, Locomotive and EMU/DMU trains)

- Center of Competence for:
 - Wheel Slide Protection System
 - ATO & ATP on board
 - High SIL Electronic
 - Condtion Base Maintenance
 - Software Design and Validation (V&V)
 - Oil free compressor and Air Dryer
 - Integration: brake frame and AGTU



S2R structure





Energy and Mass Efficient Rolling Stock (1)

- Composite and Hybrid Body-shell Structures for Rolling Stock
- Standardised automated manufacturing processes for metallic body-shells
- The Next Generation of Lightweight Door Systems and PRM Solutions

Energy and Mass Efficient Rolling Stock (2)

- · Low Noise/Low Drag Pantographs
- . A New Generation of high efficiency Traction Systems
- DC/DC Traction with Medium Frequency Transformers to save weight
- Heating, Ventilation and Air Conditioning for the Future
- Enabling Technologies and fundamental railway science for the future
- . The improved Energy Management of Passenger Trains

Energy and Mass Efficient Rolling Stock (3)

- Next Generation TCMS and on-board IT
- Evolve On-Board Wireless TCMS Standards
- New On-Board Multi-Media Standard Interfaces
- The Virtual Homologation of Train Control and Management Systems
- Energy Efficiency in passenger trains

Energy and Mass Efficient Rolling Stock (4)

- Mechatronic Low Impact Bogie
- Brake Discs in New Materials
- All electric and high pressure compressed air brakes
- New high efficiency brake controls and AGT

Safety and Integrity of the Rail System

- Interoperable supervision systems based on open IT platforms
- Robust and reliable Video Surveillance systems
- IT Security for Signalling and Communication Systems
- New, automated wheel-set inspection processes during manufacture
- Standardization of a framework and interfaces for data transfer from rolling stock vehicles
- Rolling Stock Certification and Homologation Services - Unified Test Procedures and Virtual validation of Mechanical Components
- Technologies to optimise LCC

Improve the Attraction of Rail Freight

- Tracking the movement of dangerous cargoes on the network.
- Long freight trains through 'pinch points' on the network
- Enable the rail transport of refrigerated containers (REEFERS) on the network
- Facilitate improvements to Single Wagon Freight shipments
- Improve IT Management for Intermodal Freight

Improve the Attraction and Efficiency of Urban Transit

- New Generation of Communication Based Train Control Systems
- Catenary-free Urban Infrastructure for street operations
- Reduction of generated and transmitted noise and vibration
- Urban Mobility Passenger Information Systems
- Urban Mobility Energy Management Systems
- Real Time Multi-Modal Traffic Management Support

Improve Main Line Capacity

- New Generation Radio Based ETCS/ERTMS Control Command and Signalling System
- Innovative Protection devices for AC Traction Supplies
- New Energy Management Systems
- The trackside elements of Energy Regeneration Systems including Smart Grids
- Inspection Gates for the identification of potentially damaging pantographs

S2R research areas



Faiveley participation to S2R

 Faiveley will join Shift 2 Rail participating to two Technology Research and Demonstrators



- IP1 TD5 "TCMS & BRAKES"
- IP5 TD1 "FREIGHT TRAIN ELECTRIFICATION"



Subtask

Electro-Mechanic Brake for Railway Applications

Friction Pairing Tread Brake Unit

High Safety Level electronic Solutions for TCMS and Brake Control

Next Generation Eddy Current Brake

Adhesion Management Improvement

Disk Eddy Current Brake

Innovative solutions and materials for N&V reduction in AGTU

IP1 TD5 TCMS & BRAKES





Subtask

"By wire" Communication and Electro-Pneumatic Brake System

Distributed Power LONG TRAIN

Friction Brake Technologies, Disk Brakes, WSP

Wagon and goods health monitoring and Data Transmission, Tracking, Condition Based Maintenance

Brake Module Kit

Autonomous Train Operation

Automatic Couplers

IP5 TD1 FREIGHT Electrification

