



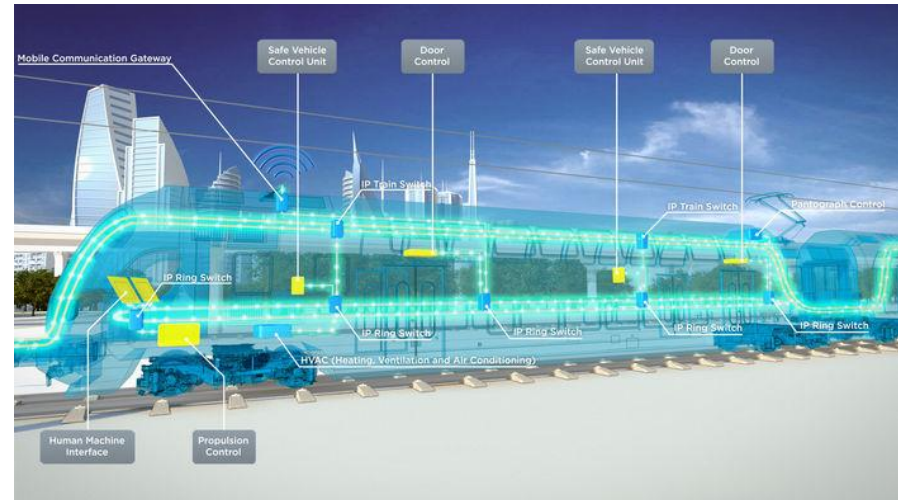
TCMS Engineering in Bombardier Transportation

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the evolution of mobility

What is TCMS? (1/2)

- Electronics are getting more and more involved in everyday life. Smartphones and cars are well known examples of this trend.
- Railway also makes the most of development in this area by implementing TCMS (Train Control and Management System), which consists of the following :

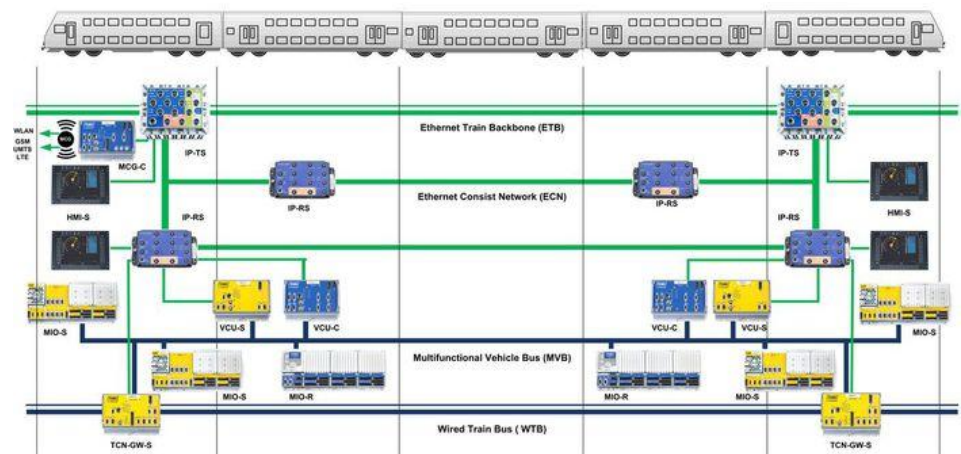
- Train control and command
- Train safety
- Maintenance
- Passenger Information Systems
- Passenger Comfort system
- Video surveillance
- Train to wayside data transfer



- All the electronic equipment, traditional train wiring and activators are connected to central processor units. The role of these central TCMS calculators is to merge the traditional wiring and more complicated electronics to reach the required train function.

What is TCMS? (2/2)

- The role of TCMS team is to program the Applicative Software of the central calculators and make sure the requested behaviour of the related train systems is achieved.
 - The product delivered by the TCMS team is a package of APPLICATIVE SOFTWARE
 - The software - after the validation process - is installed into the train calculators
- Activities inside the TCMS team are split in different area:
 - Development
 - Validation
 - Train Support
- TCMS gives you an opportunity to see many train environment aspects, functions and interfaces.
- TCMS gives you an opportunity to have a challenging job and variety in your everyday work but always surrounded with train environment and functions.



TCMS Activities: Development

- Developing TCMS Applicative Software consists of achieving the required systems functions in accordance with the train requirements.
- Development activities include the following:
 - Requirement management
 - Configuration and change management of the software releases
 - Software specification
 - Software coding
 - Software integration, sanity check and unitary tests
 - Processes and tools optimisations
- During developing TCMS software our engineers interface with many different teams, including Train System teams, Train Architects, Project Management, TCMS Validation teams and Safety teams.
- Depending on your role in the Development Team, you require a very good knowledge of the train environment or represent an excellent opportunity to gain knowledge on it.

TCMS Activities: Validation and Train Support

- Validation and Verification Engineers ensure that the Applicative Software development into the TCMS department correspond the required behaviour. This has to be confirmed in nominal and degraded scenarios.
- Validation activities include:
 - Requirement management/Test management
 - Configuration and change management of the software releases
 - Software Specification Verification
 - Tests specifications and scripting
 - Software review/Code review
 - Supporting Software integration on trains
 - Processes and tools optimisations
 - Release note restriction
- During validating TCMS software, our team works together with engineers from the following departments: Development team, Train Integration and Project Management.
- Validation is a very good entry point to be connected with the functional behaviour of trains.



Our Products

Please see below few examples of the projects supported by our TCMS teams - please click on the text below the images to view our product-related videos.



[Zefiro](#)

[Aventra](#)



Our Key Sites

Please click on the site names under the photos to view information about our key sites.



[Bruges, Belgium](#)



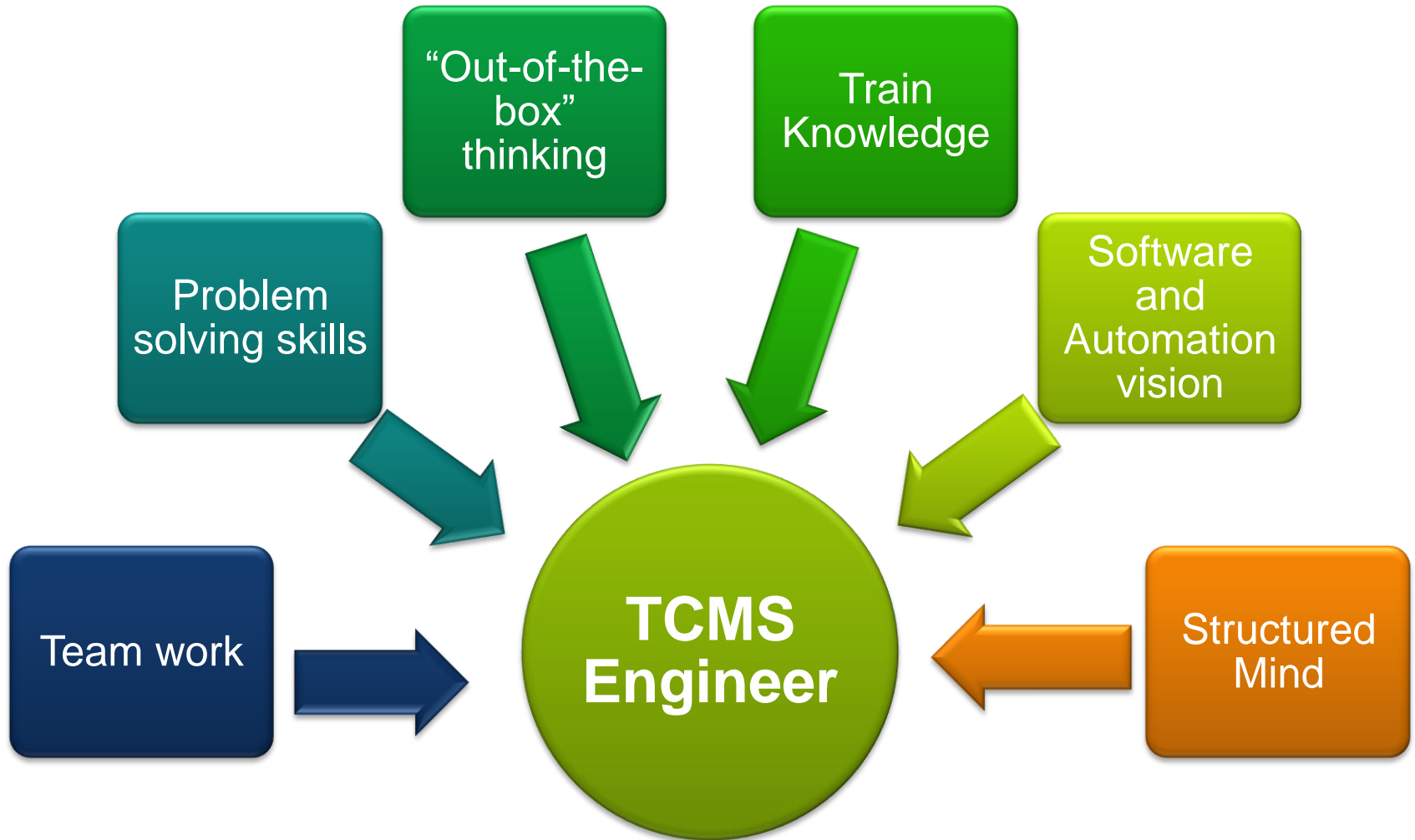
[Derby, UK](#)



[Crespin, France](#)

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What makes a great TCMS Engineer?



**What will be your
next move?**

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