



ENGINEERING RAILWAY KNOWLEDGE

From railway domain knowledge to dependable
engineering solutions

SOFTWARE • DATA • VERIFICATION • KNOWLEDGE

SINCE 1991 • 35+ YEARS • INNOTRANS 2026



OUR DIFFERENCE

Railway expertise and software engineering as one

AI² combines domain understanding, formalization and dependable implementation.

01

Understand the domain

Operational concepts, system behaviour and project constraints.

02

Formalize knowledge

Rules, data, interfaces and engineering rationale made explicit.

03

Engineer solutions

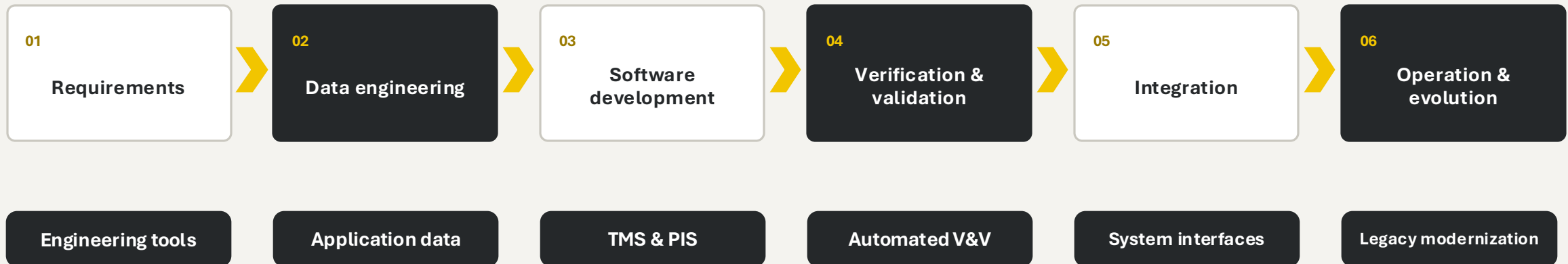
Software, tools and verification assets designed for real projects.

Not simply software for railways. Railway knowledge engineered into dependable outcomes.

WHERE WE OPERATE

Across the railway engineering lifecycle

We enter where domain complexity, data and software have to work together.



One continuous thread: railway concepts, rules, data and evidence remain traceable throughout the lifecycle.

CORE CAPABILITIES

Four capabilities. One integrated engineering approach.

The four capabilities work as one chain: software, data, verification and knowledge delivered by a single team, with no hand-over gaps.

01

Railway Software Engineering

TMS, PIS, integration components and engineering applications.

02

Data Engineering & Tools

Preparation, transformation, generation and formal validation.

03

Verification, Validation & Testing

Functional V&V, test automation, evidence and SIL4 component testing.

04

Knowledge Engineering

Taxonomies, ontologies, Knowledge Graphs and AI-assisted engineering.

CAPABILITY 01

Engineering software for complex railway operations

AI² contributes to software that supports traffic management, operational information and railway system integration.

A

Traffic Management Systems: core and advanced functions

B

Integration with interlockings, RBC and field systems

C

Passenger information: real-time operational data

D

Legacy modernization and long-life system evolution

EN 50716 (ex 50128)

DATA MODELING

REAL-TIME & SAFETY-CRITICAL SW

SYSTEM INTEGRATION

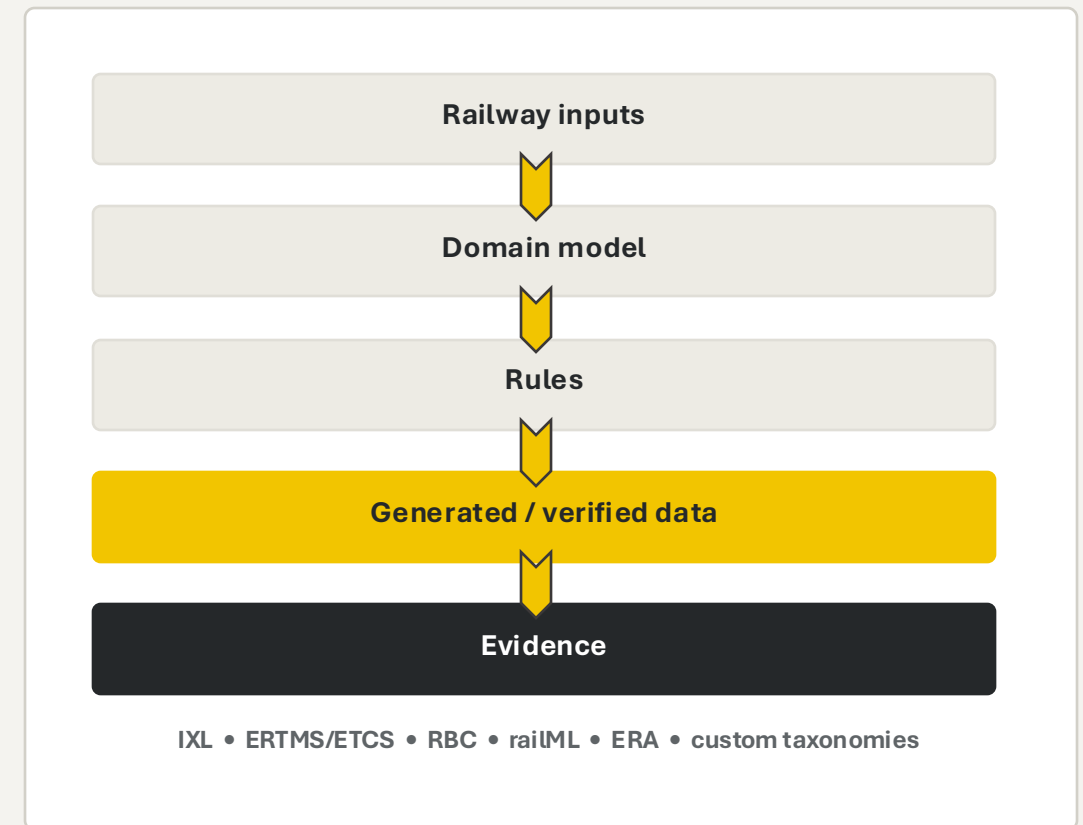
TEST AUTOMATION

SEMANTIC ENGINEERING



CAPABILITY 02

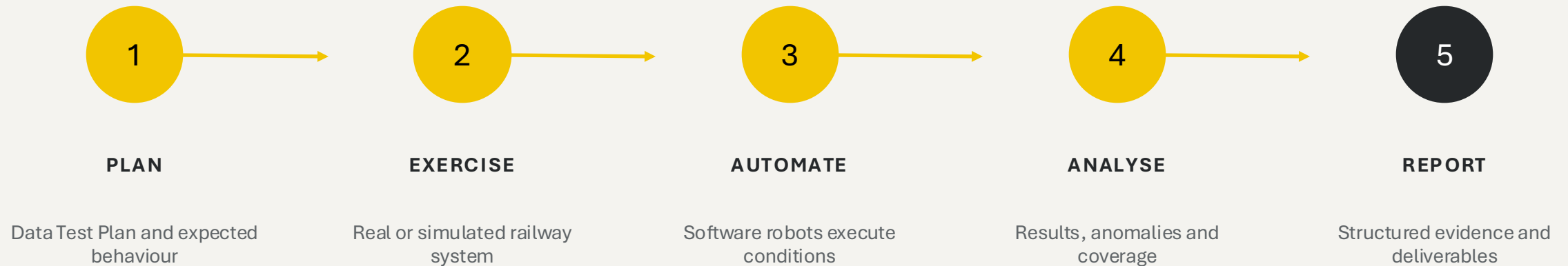
Turning railway data and rules into dependable assets



CAPABILITY 03

Verification built around railway behaviour

Automation is effective when it is grounded in operational rules and traceable evidence.



Functional V&V for ACC/ACCM • Automated testing • ERTMS onboard component testing • SIL4 context

Reusable assets shaped by real project experience

Every tool we build is meant to solve a recurring engineering problem on real project and it is reused as part of a non-stop growing suite.

ENGINEERING & DATA TOOLS

- CTManager
- DBManager
- RBCManager
- Timetable and data generation tools

KNOWLEDGE & VISUALIZATION

- exploRAIL — flagship product
- DATAInGrid
- Domain models and validation rules

SIMULATION & INNOVATION

- STRATIFY simulation framework
- Semantic engineering components
- AI research prototypes

FLAGSHIP PRODUCT

Railway knowledge, made explorable

explorAIL²

**WHAT IT IS**

Knowledge and visualization platform for railway data, rules and interfaces. Registered trademark (SIAE).

WHY IT MATTERS

Engineers explore and validate configuration data instead of digging through scattered documents.

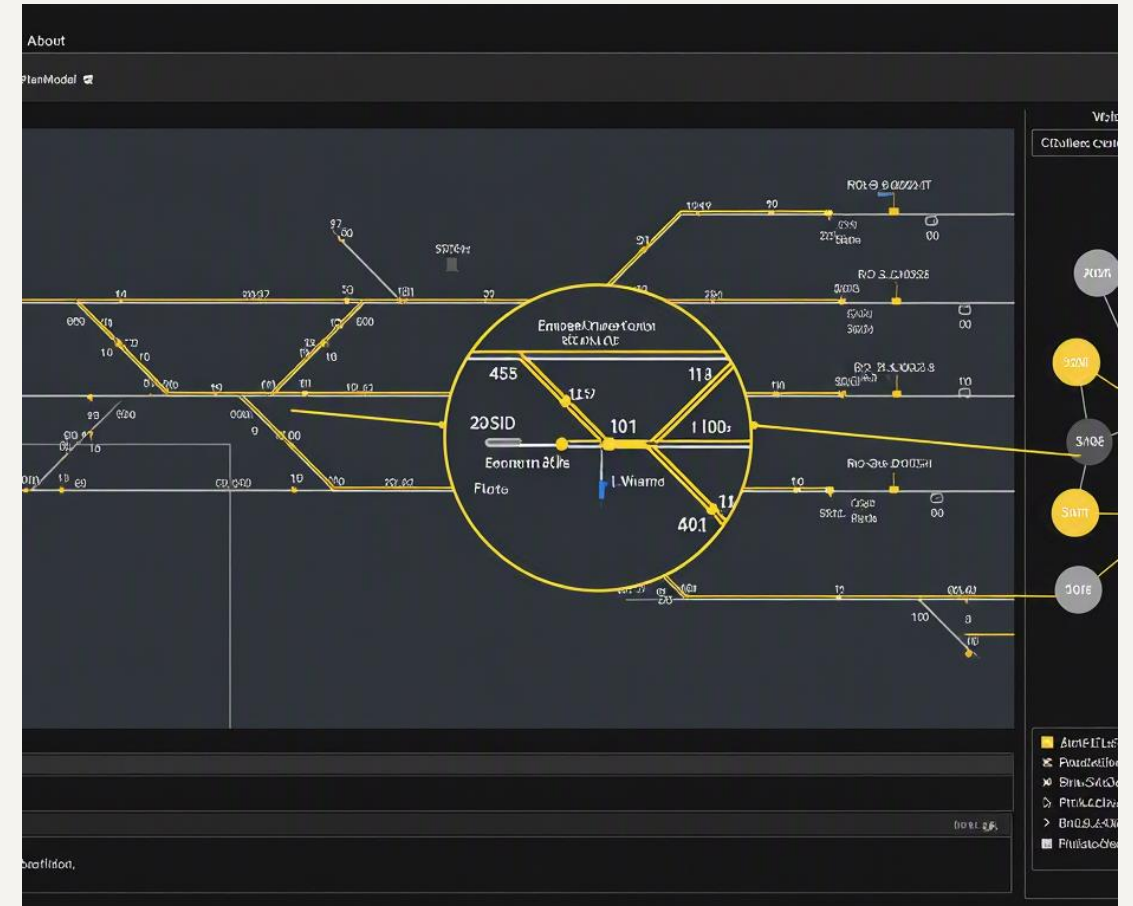
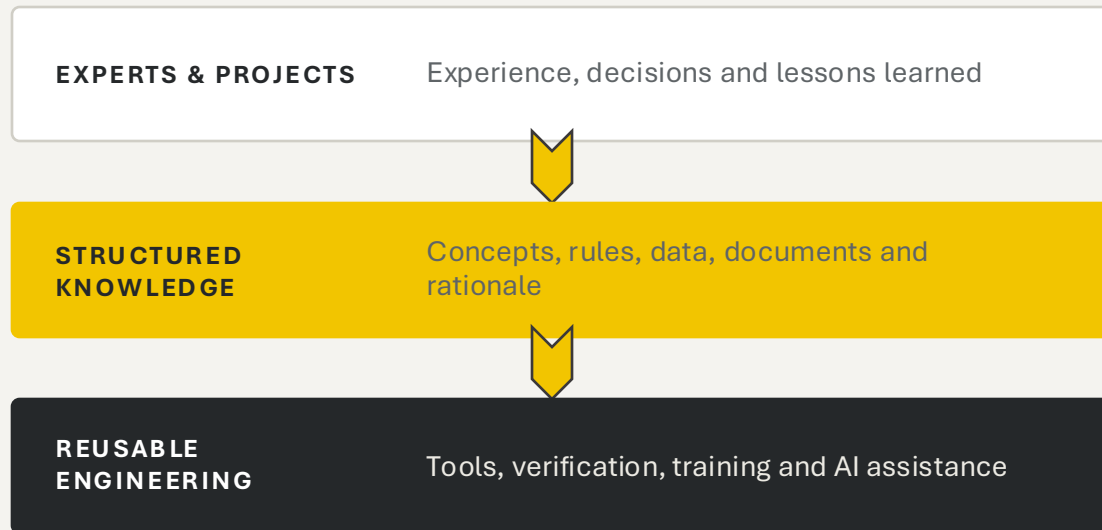
IMPACT

Estimated annual saving up to ~20,000 engineering hours on real railway projects.

Built on domain ontologies and Knowledge Graphs: railway knowledge turned into a dependable, reusable engineering asset.

Making engineering knowledge explicit and reusable

What experts know is usually scattered across documents and people; we turn it into a structured asset the whole organisation can reuse.



AI research grounded in railway domain knowledge

Ongoing research activities, not off-the-shelf AI: we investigate accountable assistance within a railway engineering context.



Innovation grounded in daily engineering practice

Products, applied research and standards work born from real railway projects.

PRODUCTS & PLATFORMS

- exploRAIL — registered trademark and software (SIAE)
- DATAInGrid — RBC, railML and AEPlan data
- STRATIFY simulation framework
- Timetable configurator for CTC/SCC plants

APPLIED RESEARCH

- symbioticRAIL2 — Symbiotic AI for railways
- Domain ontologies and Knowledge Graphs
- AI-assisted V&V prototypes

STANDARDS & SKILLS

- railML awareness and partnership
- ERA ontology
- XSD 1.1 assertions for semantic validation
- ERTMS Masterclass with CIFI (2025)



EXPERIENCE

35+ years supporting digital transformation

From industrial digital transformation to railway-specific engineering.



AREAS OF EXPERTISE

- Railway Data Preparation & Verification
- Verification & Validation of Safety-Critical Systems
- Traffic Management Systems (TMS)
- Passenger Information Systems (PIS)
- Railway Engineering Tools
- Knowledge Engineering & Semantic Models
- AI-driven Innovation for Railway Engineering

Italy • Denmark • Sweden • France • Romania • India
• Philippines • New Zealand

REAL PROJECTS. REAL CUSTOMERS. REAL OPERATIONS.

DATA PREPARATION & VERIFICATION

RFI • Banedanmark • Romania •
NCRTC • NSCR

VERIFICATION & VALIDATION

Bologna Centrale • AV Bologna-
Firenze • ACC/ACCM

TRAFFIC MANAGEMENT

CTC/SCC • Trafikverket • SNCF •
Banedanmark • KiwiRail

PASSENGER INFORMATION SYSTEMS

RFI • Sardinia Network •
Ferrotramviaria

Supporting operational railway systems through software, data and verification engineering.

TRUSTED BY INDUSTRY LEADERS

ALSTOM

ANGELSTAR

mermec

Progress Rail
A Caterpillar Company

ThalesAlenia
Space
a Thales / Leonardo company

HUMAN VALUES

The values behind dependable engineering

Railway systems are built by people. These are the values we bring to every project.

01**Responsibility**

We take ownership of what we deliver, because safety and service depend on it.

02**Trust
& Transparency**

Clear communication with customers and partners, also when problems emerge.

03**Sharing
& Growth**

Knowledge is passed on: mentoring, training and continuous learning for our people.

04**Respect
& Collaboration**

Diverse teams, listening, and long-term relationships built on mutual respect.



LOOKING FOR ENGINEERING CAPACITY?

Need support for data preparation, verification or railway software?

Let's talk.

