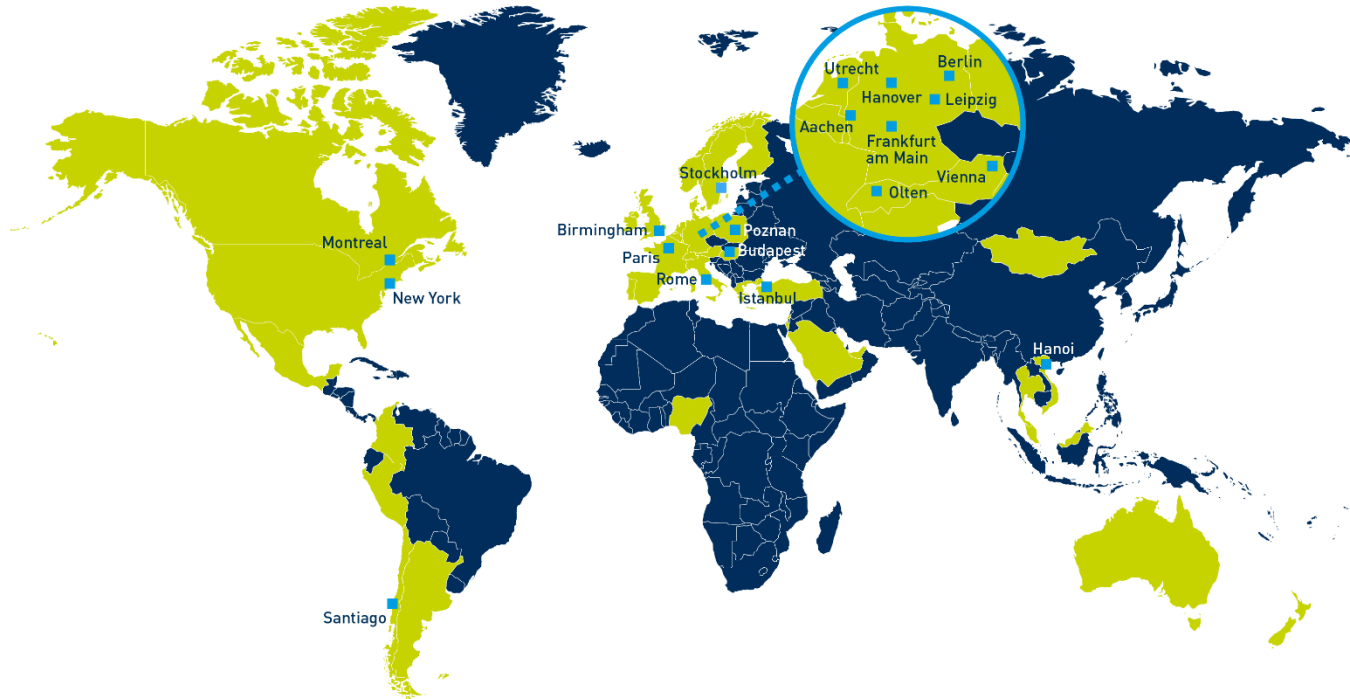


TAF/TAP IMPLEMENTATION FROM AN IT SUPPLIERS' POINT OF VIEW

DR. CHRISTIAN BLOME

IVU TRAFFIC TECHNOLOGIES AG REPRESENTED WORLDWIDE



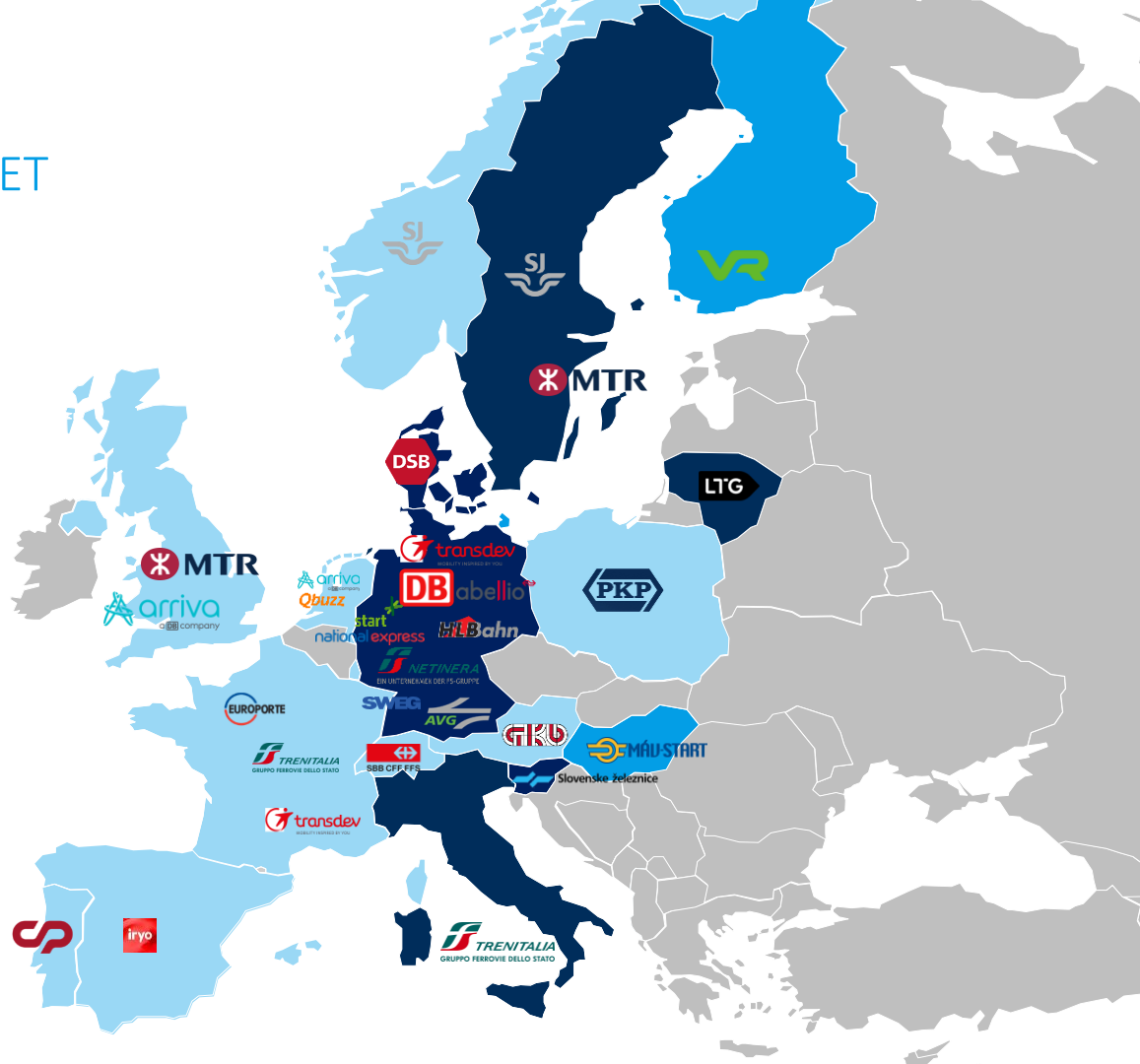
■ 500 clients
■ 19 locations

IVU TRAFFIC TECHNOLOGIES AG ON EUROPEANS RAILWAY MARKET

- Many national railway companies, e.g. Deutsche Bahn, Danish, Swedish and Finnish railways and Trenitalia
- Public and private railway companies
- Ranging from small concessions with only single lines up to regional and national networks

Legende

- Market leader
- Strong presence on the market
- Present on the market
- No railway customer



IVU TRAFFIC TECHNOLOGIES AG

THE IVU.SUITE FOR BUS, TRAMS, FERRIES AND RAIL



SERVICE PLANNING

IVU.timetable

Network and timetable planning

RESOURCE PLANNING

IVU.run

Vehicle scheduling

DISPATCHING

IVU.vehicle

Vehicle dispatch and depot management

FLEET MANAGEMENT

IVU.fleet

Control centre

TICKETING

IVU.fare

Tariff management and fare collection

PASSENGER INFORMATION

IVU.realtime

Dynamic passenger information

CONTROLLING

IVU.control

Accounting and reporting

IVU.pool

Data integration

IVU.duty

Duty scheduling

IVU.crew

Personnel dispatch

IVU.cockpit

On-board software

IVU.ticket

On-board ticketing

IVU.journey

Integrated journey planner

IVU.pad

Digital workplace

IVU.box

On-board unit

IVU.validator

E-ticketing terminal



IVU.suite

Powerful standard product for all fields of activity of transport operators: from planning to the settlement of transport contracts.



IVU.integration

Interconnecting systems

We ensure seamless system interaction and smooth data flows.



IVU.xpress

Proven project process

Our implementation process allows you to plan your project more easily and ensures a rapid go-live.



IVU.support

Highly skilled support team

Even after implementation, our highly skilled support teams will be available at all times.



IVU.cloud

Reliable hosting

Powerful, reliable and with high levels of availability: We will host and operate your system in our cloud.

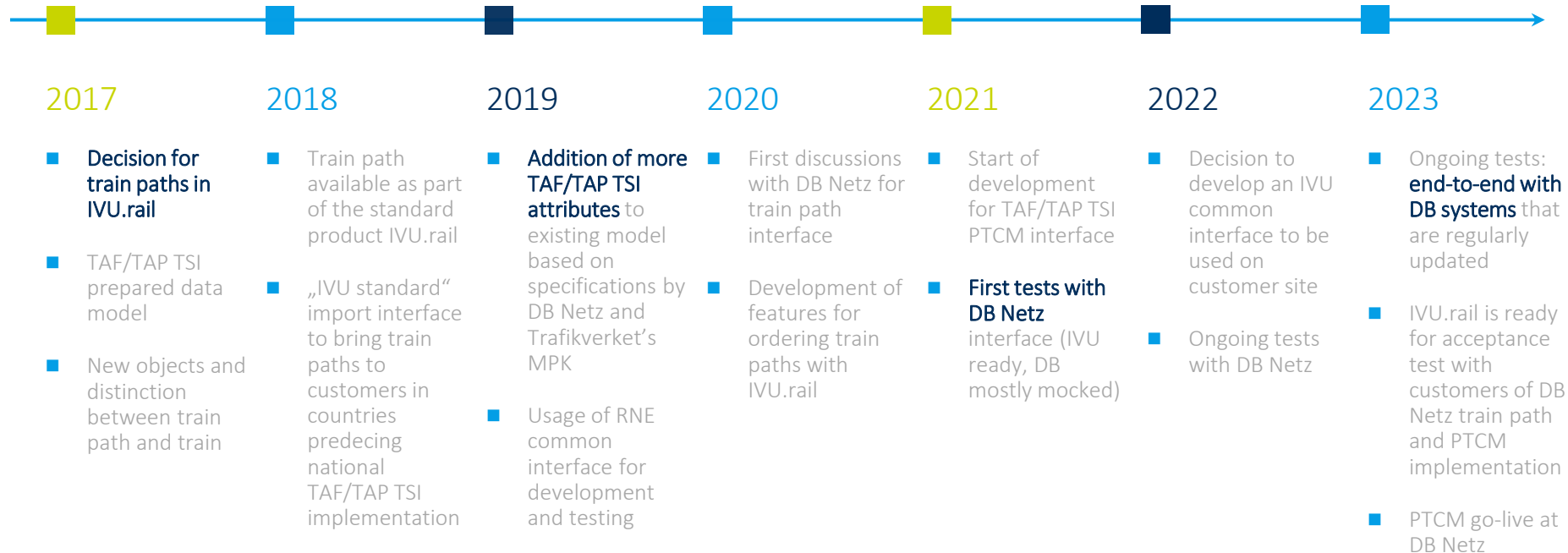


IVU.consult

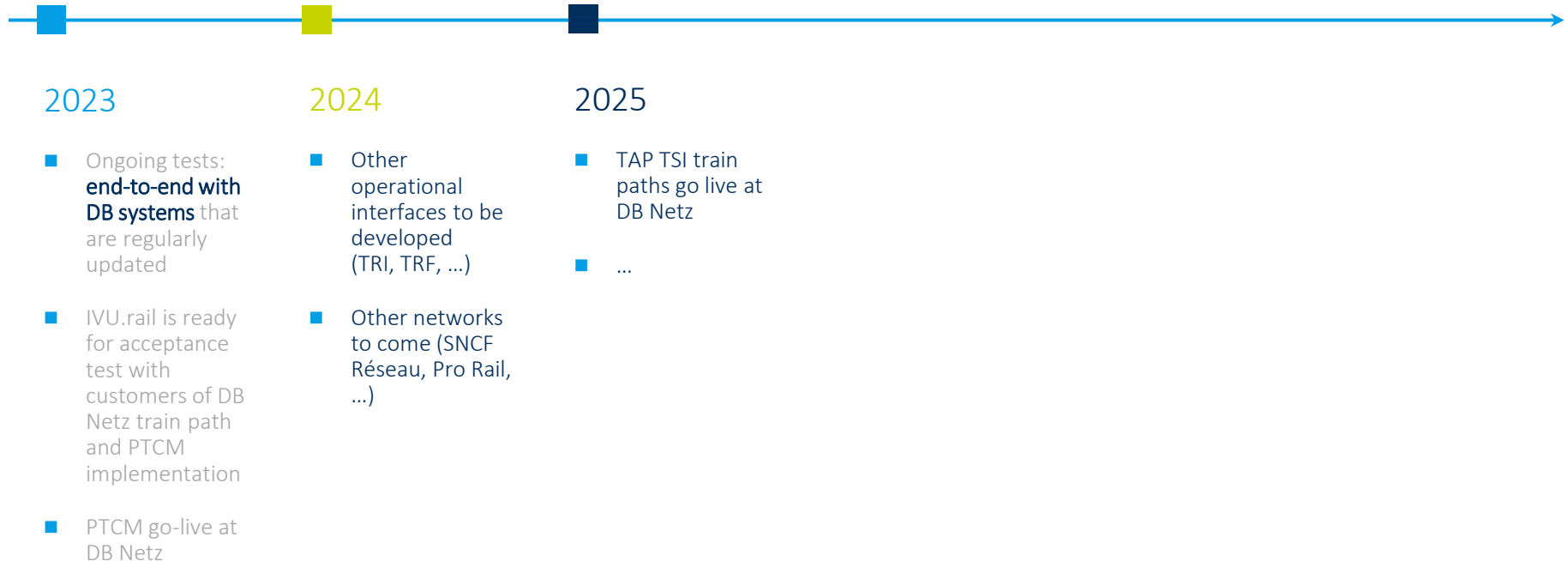
Strategic consulting

We support you in improving your offer and optimising your processes with the IVU.suite products.

TAF/TAP TSI AS PART OF IVU.RAIL TIMELINE



TAF/TAP TSI AS PART OF IVU.RAIL TIMELINE



SUCCESS FACTORS

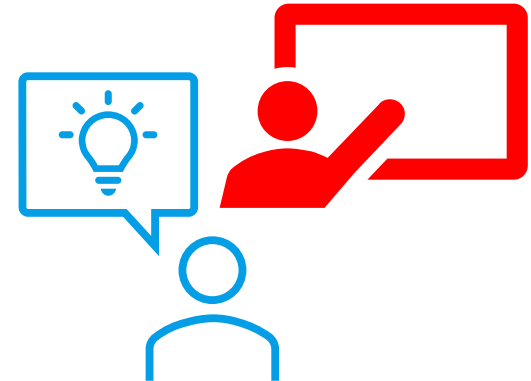
DIRECT CONTACT BETWEEN IVU AND INFRASTRUCTURE MANAGERS



- **Regular information** events (with all IT suppliers)
- Regular newsletters with information on updates on infrastructure manager site

- **Fast bidirectional feedback** in early implementation phase via file exchange
- Technical exchange and answers to detailed questions during implementation phase

- **Integrated tests** end-to-end between IVU and infrastructure manager
- Feedback based on data of real trains by IVU customers



SUCCESS FACTORS

SPECIFICATIONS AND DOCUMENTATION

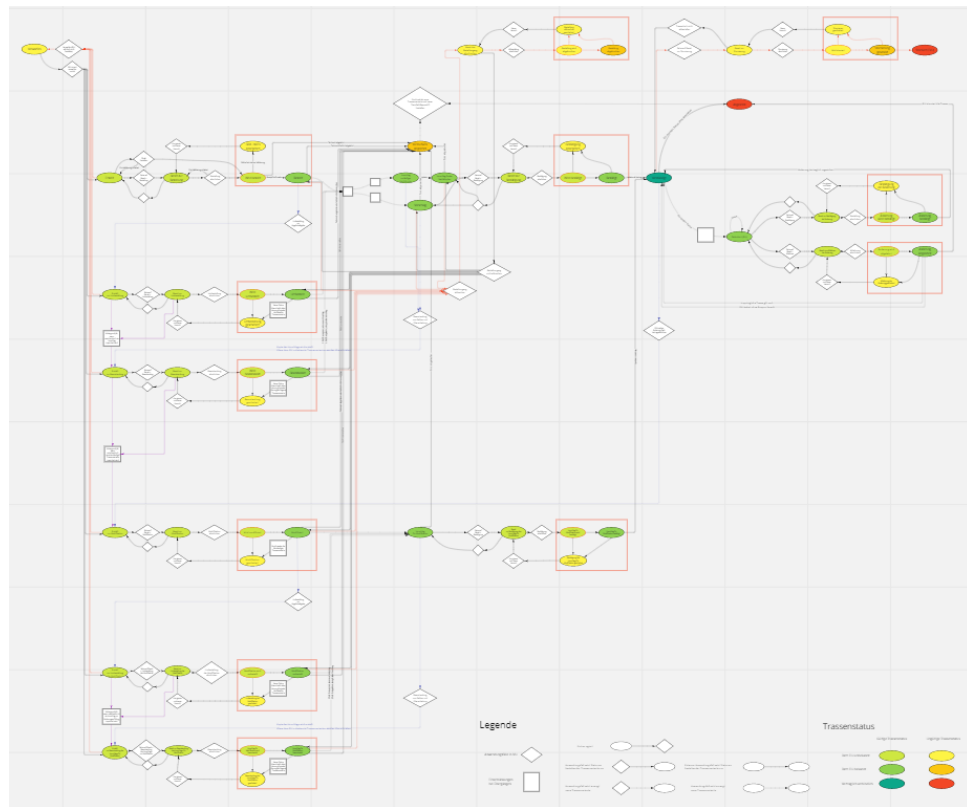
- Great pleasure to add such a well documented and elaborated European standard to our standard product IVU.rail
 - Very well documented interface specifications for train paths and operational interfaces such as PTCM
 - Sector Handbook is a helpful source for orientation and as knowledge base
 - Specification and documentation documents of DB Netz are the best that we have seen for TAF/TAP TSI in Europe yet
- We were able to implement fluently due to perfect documentation.
- Remaining ambiguities could be solved with direct bidirectional exchange in bilateral meetings or big exchange rounds



REMAINING RISKS

EVEN IN ONE SINGLE RAILWAY NETWORK IN EUROPE

- Ordering and assigning train paths to railway undertakings uses the same interface language
- Though the **process** therefore is **network specific** and may vary!
- Network specific parameters reflecting this **network specific process** (and **support for IM internal legacy systems**) have to be analysed for all networks to come



REMAINING RISKS

EVEN IN ONE SINGLE RAILWAY NETWORK IN EUROPE

- Data exchange between railway undertakings is not at the same level – but needed for correct train path requests and updates (e.g. routeID update).
- PTCM seems to be one candidate to be used between some of them.
 - We see potential for more European harmonisation and more digital communication between RU.
 - We see the danger of fragmentation of PTCM dialects due to network specific specifications IM are providing.



REMAINING RISKS

EVEN IN ONE SINGLE RAILWAY NETWORK IN EUROPE



*„From manual, annual, national to
automatic, continuously, international*

*Kristian Schmidt, director DG MOVE at the European Commission,
on the SmartRailEurope Conference in Brussels in May 2023*

An aerial, long-exposure photograph of a busy city intersection at night. The image shows multiple lanes of traffic with light trails from cars and buses. A prominent feature is a large, modern building with a green roof and a white, curved architectural element. The surrounding area is filled with tall buildings, some with lit windows, and a complex highway interchange. A semi-transparent blue rectangular box is overlaid on the right side of the image, containing three lines of white text in different languages.

THANK YOU FOR YOUR
PATIENCE

MERCI POUR VOTRE
ATTENTION

VIELEN DANK FÜR IHRE
AUFMERKSAMKEIT