IMPULSE + DISCUSSION

ALPS AT A DEAD END?

Setting the course for mobility

How the entire Munich–Verona corridor can become more reliable, predictable and competitive

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One corridor. One rulebook. One train.

The central question

How can technical capacity become a marketable service?

1

RELIABLE

Arrival as promised

2

PREDICTABLE

Capacity with lead time

3

SIMPLE

Cross a border without friction

No more train paths alone: a better system promise

The Brenner is Europe’s stress test

2.465 million

trucks crossed the Brenner in 2024

50 million tonnes

of freight per year at the Alpine crossing

435 km

Munich–Verona rail route (2h28)
Two national borders
Four-track expansion

Every operational weakness becomes visible here: borders, gradients, works, scarce capacity and national rules.

The current modal split captures the problem in one figure

Brenner · latest harmonised figure, 2023



Demand pressure
The Brenner is the busiest Alpine crossing for freight transport.

System promise
Rail freight growth depends not only on capacity, but also on reliability that customers can book..

Target
Every reduction in cross-border friction makes rail more competitive.

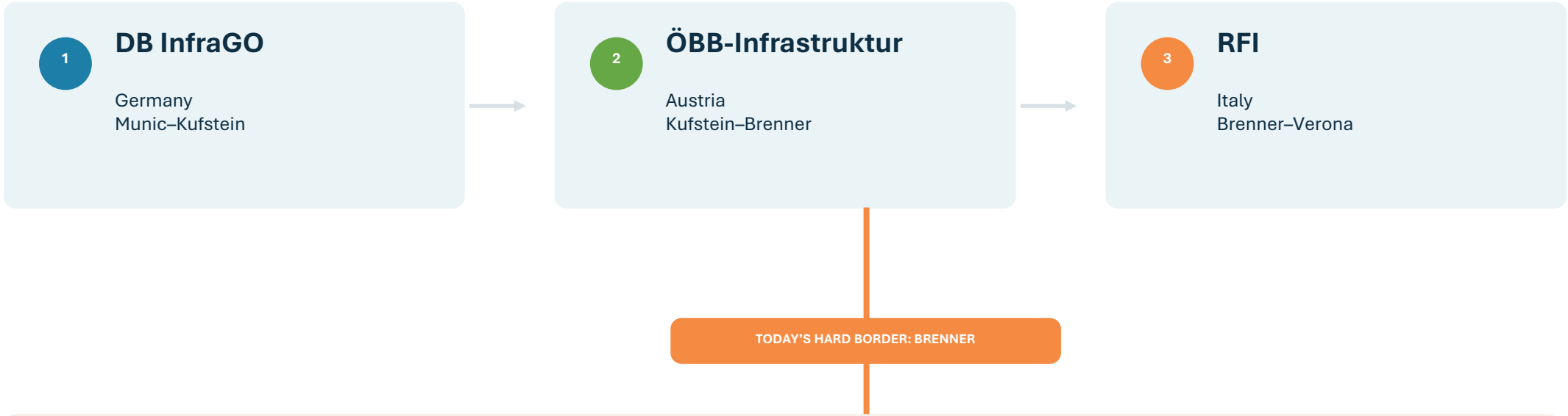
From an Alpine stress test to seamless corridor operations.

The Brenner corridor runs from Munich to Verona

1	2	3	4	5	6
MUNICH	**ROSENHEIM**	**INNSBRUCK**	**BRENNER**	**FORTEZZA**	**VERONA**
Northern access / terminal area	Northern access	Northern access / Brenner Base Tunnel	Brenner Base Tunnel	Base Tunnel / southern access	Southern access / terminal area

A bottleneck between two points limits the performance of the entire system.

Three networks, three rulebooks: a major break today



Why trains stop today

Brake calculation · border and technical checks · second crew member in Italy · language and rules · magnetic track brake

Target: One corridor. One rulebook. One train.

Access lines determine system capacity

NORTHERN ACCESS: MUNICH–INNSBRUCK

Munich–Rosenheim
Planning and approval phase

Rosenheim–Kufstein
Planning and approval phase

Lower Inn Valley
In operation, under construction, planning and approval

SOUTHERN ACCESS: FORTEZZA–VERONA

Fortezza–Ponte Gardena
Under construction

Bolzano bypass and Lower Adige Valley
Planning and approval

Trento–Verona
Under construction, planning and approval

740-METRE TRAINS · ETCS · OVERTAKING TRACKS · NODE CAPACITY

The A13 and A22 show the pressure of demand

A13/A22 · 2.465 million trucks

Crossed the Brenner’s northern ramp in 2024
Around 7,315 trucks per day at the Schönberg toll station

A22 · 46,000 vehicles/day

2024 average on the Brenner–Modena motorway
5.28 billion vehicle-kilometres travelled

Road and rail form a single capacity market

Construction work, closures and unreliable rail services directly affect supply chains, congestion and diversion traffic.

Freight flows connect two strong economic regions

NORTH OF THE ALPS

Bavaria to North Rhine-Westphalia

Industry, automotive, chemicals, trade and major logistics hubs generate and receive freight flows across Europe.

Bavaria 2024: €60,258 GDP per capita

SOUTH OF THE ALPS

Po Valley

Lombardy, Piedmont, Veneto and Emilia-Romagna form Italy's industrial, export-oriented core.

Lombardy 2023: €49,100 GDP per capita

Reliable transit times reduce inventory, buffer and disruption costs across the entire value chain.

A corridor requires joint decisions

EU	TEN-T standards, financing, competition
STATES	Expansion programmes, regulation, funding
REGIONS	Environment, traffic management, acceptance
OPERATORS	Train paths, works, disruption management

EU classification: Munich–Verona is a major bottleneck on the Scandinavian–Mediterranean Corridor

Regional framework for modal shift

1

AVOID

unnecessary journeys and empty runs

2

SHIFT

more freight to rail and combined transport

3

IMPROVE

road transport, data and processes

Tyrol calls for coordinated Alpine policy. South Tyrol combines infrastructure, a digital green corridor and support for combined transport.

Terminals and operating quality also matter

30 million tonnes

Freight handled each year at Interporto Quadrante Europa

16,000 trains

Shunted annually at the Verona freight hub

7–17 hours

Current Munich–Verona transit-time range according to BRECO

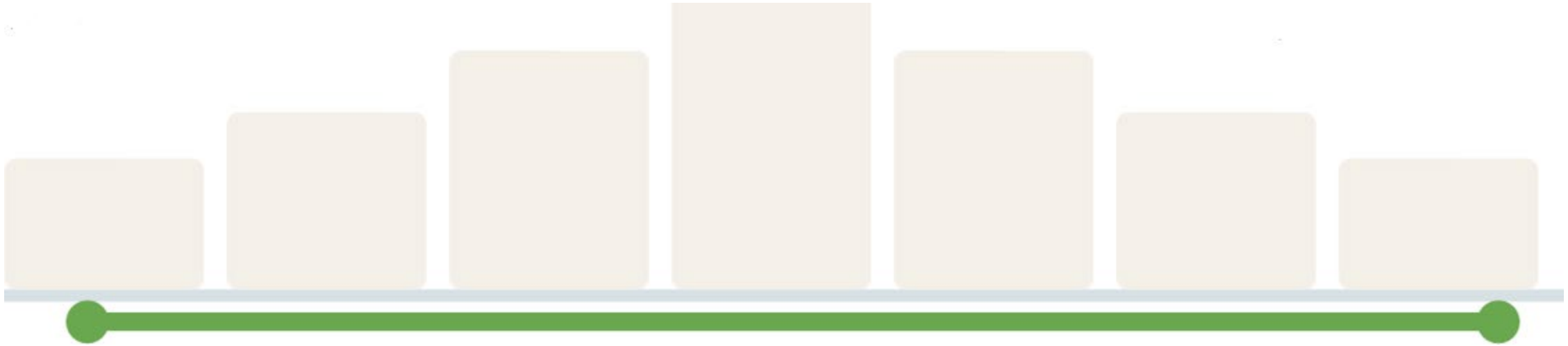
The tunnel creates capacity. Terminals, harmonised data and stable operations make it marketable.

QUADRANTE EUROPA: 8 MILLION TONNES BY RAIL · 120 COMPANIES · 13,000 JOBS · MORE TERMINALS NEEDED

Hardware creates the conditions

TODAY

WITH THE BASE TUNNEL



up to 26‰

4–7‰

Steep existing line: multiple traction

Flat railway: longer, heavier trains

The Base Tunnel changes railway operations

TODAY: handover at the pass

Border stops as a key part of the process: changes in rules, checks, personnel, language and traction.

WITH THE BBT: through-running in the tunnel

Stopping at the border can no longer be the standard. In future, stops will be used for breaks, driver changes or operational purposes.

Flat railway: 4–7‰ instead of up to 26‰, reducing multiple traction for some train weights.

Impact: shorter transit time, better predictability, higher capacity and lower cost per tonne.

What slows us down today? Four levels, four solutions

Infrastructure is only one part. A sub-six-hour corridor requires separate solutions for infrastructure, capacity, interoperability and operations, combined in one product.

INFRASTRUCTURE & TOPOGRAPHY

TODAY	SOLUTION	BENEFIT
• Gradients and curves; Brenner crossing: 1 hour 45 minutes • Multiple traction; loss of energy and time	• BBT + access lines/new sections • Flatter route, 740-metre trains	• Around 70 minutes at the Brenner • Only one locomotive required for certain train weights

CAPACITY & TIMETABLE

TODAY	SOLUTION	BENEFIT
• National train-path planning • Construction works, overtaking windows, railway nodes and terminals	• EU Capacity Regulation • Multiannual digital corridor planning	• More reliable train paths • Smaller buffers and better capacity utilisation

INTEROPERABILITY & RULES

TODAY	SOLUTION	BENEFIT
• 3 IM‘s, 3 national rulebooks • Brake calculations, technical and border checks, language requirements, and a second crew member in Italy	• Common corridor rulebook • Train preparation, digital route book and ERTMS Level	• Border stops become the exception • Through-running with one train driver from Munich to Verona

OPERATIONS, STAFF & DATA

TODAY	SOLUTION	BENEFIT
• getrennte Leitstellen/ETA-Silos • >6 h Arbeitszeit: 30-min Pause einplanen	• Separate control centres and isolated ETA data • For working times exceeding six hours: schedule a 30-minute break	• The target of under six hours reduces additional stops* • Predictable train rotations instead of operating individual trains

Transit-time logic: published times currently range from 7 to 17 hours; no robust average exists. Target <6h = lower gradients + fewer border stops + less variation.

* Only if the driver’s total working time does not exceed six hours; preparation, shutdown and other tasks count as working time.

Sources: BCP/BRECO; BBT SE; §5 EFPV; Regulation (EU) 2026/1184 · Martin Ausserdorfer · RailTraction Company

Software determines how capacity is used

1	**TIMETABLE**	Plan capacity across borders
2	**OPERATIONS**	Manage disruptions jointly
3	**RULES**	Harmonise authorisation and language
4	**DATA**	Share ETA and status end to end
5	**INCENTIVES**	Align cost and quality

Five breaks turn one journey into many systems

PATH	LOCOMOTIVE	STAFF	OPERATIONS	DATA
national planning	system change	language / rules	separate control centres	no shared view

A single break costs minutes. Several breaks cost trust.

TARGET: ONE CORRIDOR · ONE OPERATING PICTURE · ONE CUSTOMER INFORMATION

Interoperability is the key lever before opening day

1	Brake calculation	common methodology
2	Border and technical checks	pre-checked train
3	Locomotive crew	role-based target model
4	Language and rules	common operating logic
5	Train and vehicle data	available digitally

The BCP is therefore not an advisory body, but the operational laboratory for a Single European Railway Area.

Border process: from handover point to through-running

BEFORE

Information arrives late
Responsibility is fragmented
Large buffers

NEXT STEP

One shared slot
A pre-checked train
One escalation path

TARGET

Through traction
Role-based language rules
Shared ETA

Metric: handover time + deviation from the promised corridor slot

Capacity must be predictable and usable

YEARS	**Framework capacity**	Investment and service planning
MONTHS	**Stable train paths**	Customer contracts and resources
DAYS	**Flexible adjustment**	Construction work and demand
HOURS	**Active management**	Disruption and recovery

Capacity management is not a timetable product. It is a continuous process.

European rules turn capacity into a corridor product

01

Plan over several years

Make capacity visible earlier by coordinating frameworks, volumes and works strategically.

02

Coordinate across borders

Not three sets of residual national capacity, but one continuous slot from Munich to Verona.

03

Exchange data digitally

Data exchange among infrastructure managers, railway undertakings and operational stakeholders makes capacity usable.

04

Protect market segments

Pre-planned capacity for freight and cross-border traffic on bottleneck sections.

In short: the new Capacity Regulation shifts the focus from the annual timetable to rolling, digital corridor management.

Digital standardisation: from paper processes to system operations

1

ERTMS Level 2

A common train-control system as the basis for capacity, safety and cross-border operations.

2

Digital route book

Infrastructure data from RINF, with rules and route information supplied digitally and consistently for safety-critical tasks.

3

Train preparation

The same data, checks and allocation of responsibility across borders before the train departs.

These standards turn added infrastructure into a reliable product that can be planned, operated and monitored.

Rail’s promise to the customer



BOOKABLE

one offer instead of individual parts



VISIBLE

one ETA instead of data silos



CONTROLLABLE

a recovery plan instead of fragmented responsibility

Reliability is what customers buy, not train kilometres.

What can work before “the tunnel” opens

1 Corridor control

Create a shared operating picture and escalation process

2 Pilot trains

Designated train pairs with a through-running process

3 Construction pact

Plan works early, consistently and jointly

4 Quality contract

Disclose KPIs, causes and responsibility

Workshop: Where do we start?

12 minutes · groups of 4–6 people

01	**BOTTLENECK**	Which specific break costs the most quality today?
02	**LEVER**	What can change within 24 months?
03	**RESPONSIBILITY**	Who must decide jointly, and which metric counts?

RESULT: 1 ACTION · 1 OWNER · 1 KPI

THREE SWITCHES

Complete the Base Tunnel and access lines.
Simplify the software.
Connect responsibility.

Modal shift does not begin on opening day.
It begins with today’s decisions.

One corridor. One rulebook. One train.

DISCUSSION

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