RAIL CAPACITY MANAGEMENT

Our vision is a future rail infrastructure capacity management that is flexible, digital and European.

Why is rail and railway capacity management important?

Rail has been consistently recognized as a **sustainable and future proof transport system** in Europe. It is the **backbone for a much expected intermodal land transport system** able to contribute towards social cohesion and to strengthen the European internal market while increasing efficiency of transport services. Rail outperforms all other modes of land transport in terms of its energy efficiency and environmental parameters.

The possibility of **the current rail network to offer new and enhanced rail services** is i**nsufficient and below optimal considering the existing infrastructure and its state**.

Rail is **6 times less energy consuming and emits 9 times less CO_2** and other air pollutants while at the same time providing **passenger and freight services which are 80 times safer** when compared with other land transport modes.

Although **there has been efforts to increase the potential of the existing infrastructure**, the **delayed or limited investments often require mitigation measures** to ensure safety, such as reducing the speed of trains.

This double perspective, **expanding the network and improving its performance, has to be engaged in tandem**. In the meanwhile, there is a need to **reduce the loss of capacity in the existing network to a minimum**.

Capacity is lost whenever time is lost, and time is lost, when a train has to circulate at a lower speed than expected or stop for more than needed usually in rerouting. Capacity can be also lost when trains are cancelled and do not run, while the train path has been already allocated and booked.

The fact is that **rail services are being provided on the brink of the capacity of the current network**.

Looking ahead, the **railway network will undergo a major transformation in the decade to come, due to many investment projects**, in order to r**estore and improve the performance of the ageing rail infrastructure and to complete the Trans-European Transport Network (TEN-T)**, impacted by temporary capacity restrictions that are needed to maintain rail's high safety standards and to build new infrastructure.

All this makes **efficient and effective capacity planning in the EU all that more essential**, and a matter of survival for the railway sector, **particularly for rail freight where 50% of the volume is carried cross-border**.

OUR VISION IS A FUTURE RAIL INFRASTRUCTURE CAPACITY MANAGEMENT THAT IS FLEXIBLE, DIGITAL AND EUROPEAN.

What is Rail Capacity Management?

Rail Infrastructure Capacity Management is more than creating a path for a train to run on. Rail paths are a key asset for Railway Undertakings (RU). Without market-fit capacity, RUs cannot operate. It is about making increasing transport needs possible for both passengers and freight on a single, mixed used, highly utilized, dense network.

Each service that is provided consumes capacity. In railways the available capacity is consumed mainly on three activities: running passenger trains, running freight trains and performing maintenance or renovation works on existing lines. These activities draw time from the available capacity of railway infrastructure, alongside with external factors which can cause disruptions (for instance environmental factors, such as excess heat, floods, wildfires, etc.)

One of the reasons that explains rail's high performance in terms of security and energy efficiency, is the fact that **operations are planned and happen in a highly controlled environment** (as in air travel).

Similarly to aviation, running a train requires a planned path (with an origin and destination) checking if the capacity is available, setting a timetable, and giving prior clearance before any trip is performed**.**

A train does not depart when it wants, take the trajectory it wants and arrive at any given railway station of choice.

By comparison, road transport occurs in an open system, where normally access to the infrastructure does not require ex-ante setting of the route, establishing a pre-determined travel time, including stops to observe along that route, or clearance to start the trip. **This explains why there is traffic jam on roads, which cannot occur in railways or aviation, because if the capacity is not available trains can't circulate.**

Railway capacity has been consistently used to the limit, meaning overall and available capacity is scarce. This means that the available capacity has to be very well calibrated balancing the needs of services to provide, which means prioritizing and careful planning.

Fact is, that the process to plan rail capacity has to be urgently and significantly improved, **as it is inherently rigid, has long lead times to react to requests** for some services and has **fragmented approaches in the EU**, creating significant challenges for cross-border operations where time is key. Traditionally, capacity management is generally **organized manually and nationally**. Processes are inflexible and involve annual ordering dates and long response time for fixed validities of timetables. Very often, it is challenging to plan the movement of trains across borders with the lack of coordination and harmonization in national timetabling practices.

On top of the regular planning, the impact of construction works is usually handled on a case-by-case basis, insufficiently aligned and unable to provide both the stability and visibility that our final customers expect.

Today the infrastructure capacity management process is predominantly national, annual, and highly manual.

8332 km
of congested infrastructure,

4488 km
on the main corridors.

ÖBB / Harald Eisenberger

Why do we need a European capacity management?

One of the key success stories of the European Union is the internal market. To ensure that this success story continues over the coming years, **we need to ensure that cross-border transport is facilitated and is not hindered at borders**. Whereas this is largely achieved on roads, air and waterways, it is not yet the case on rail.
Rail was one of the first high capacity motorized forms of land transport modes which was historically tailored to respond to the national needs in fragmented territories where preserving national sovereignty was the paradigm.

Although starting from this fragmented patchwork, already today, more than 50% of all rail freight volumes in Europe cross at least one border, and there is substantial potential for growth **both for passenger and freight trains alike**, if rail can be more attractive to both existing and potential customers.

- **internationally determined planning** / capacity management
- better **harmonization** of timetables cross border
- improved **cross-border coordination** and planning of maintenance/construction works (e.g. on rerouting)

Running a train through Europe needs to be easier and swifter than it is today. The same difficulties are not borne by other modes of transport, which benefit from a more contemporary and harmonized set of common rules. Therefore, **the EU needs to act collectively in the development and implementation of a similar harmonised framework for rail, by removing national obstacles**, supporting the systemic approach the rail system requires to evolve and reduce fragmentation, therefore facilitating the movement of passengers and goods by rail across Europe.

The current patchwork of national infrastructure systems in place adds significant complexity and overcomplicates railway operations, increasing costs, hampering efficiency also due to extended travel times, particularly in freight services. Loss of time means loss of capacity and loss of money.

Overcoming the constraints set by nationally centered systems, requires a new, balanced, common European approach, which will help both national and cross-border traffic alike to reach their potential and achieve a true modal shift.

Why capacity management is part of the solution?

We need rail infrastructure capacity management that serves customer needs.

To enable a seamless flow of international rail traffic there is a need to **adopt a system-wide approach to the rail system**, and particularly, Infrastructure Managers (IMs) require a harmonized framework for capacity management that will enable Railway Undertakings (RUs) to provide their customers with attractive services. All this with the inclusion of **reciprocal commercial conditions** (incentive fees to both IMs and RUs to ensure that rail infrastructure is used as contracted and not lost). This is particularly sensitive for cross-border freight services, serving clients, that require more flexibility, due to the specific and dynamic needs of their supply chains.

The sector developed a new approach of Timetable Redesign (TTR), a project that aims at creating a new process for allocation of rail capacity, by improving the current practices, in particular by achieving harmonized request deadlines that fit the needs of both freight and passenger rail operators.

Based on this sector-led project, the European Commission proposed an EU Regulation in mid-2023 to help the sector harmonise capacity management. The European Parliament, Council and EU Commission are currently negotiating on the final text of the Regulation. This regulation will only be effective if it is applied by all member states without exemptions.

What is TTR?

TTR is built on strategic capacity planning with balanced distribution of capacity according to different market needs, with national and international coordination throughout the process. This allows more flexible planning/ordering of train paths.

Strategic planning of the railway infrastructure consists of 3 major steps. It starts from an assessment of the available infrastructure capacity and is assigned balancing the needs of the 3 areas that consume the available capacity, notably, freight and passengers transport, as well as construction/ maintenance work. The 3 steps are:

Capacity Strategy describing 5-3 years ahead the **principles**:

- for the planning of specific lines,
- high level traffic forecasts,
- developments in physical capacity (more/less tracks…), and
- general approaches how to handle construction works on this line (incl. rerouting options).

Capacity Model establishing between 3 to 1,5 years ahead the principles of:

- Expected number of trains to run for traffic types
- Splitting of capacity for different ordering times (well ahead in so called Annual Timetable or for the shorter-term Rolling Planning).
- better identification of the amount of capacity lost due to construction works.

Capacity Supply Plan between ca 1,5 to 1 years **provides a pre-planning**:

- showing a workable timetable, with specific or rough proposals depending on the capacity available.
- Serving as a basis for ordering, showing what can be ordered or what is safeguarded to allow short-term requests.

The 3 elements of strategic planning are key to enable an optimal use of the infrastructure and provide good quality paths also to those with short notice market demands.

All three elements are created through an intense domestic and international sector dialogue between RUs and IMs, to be as close as possible to the market needs.

After the strategic planning, the capacity is then made available for ordering according to different market needs:

Annual Timetables can be ordered early in advance, providing stability for customers.

Rolling Planning can be ordered later, shortly before transport (between four and one month before the first day of operation), building on safeguarded capacity and thus allowing competitive transport times. It can also be carried over into the next annual cycle, not limiting transport to artificial rail planning cycles not known in other industries.

Ad hoc as the very short-term possibility, using remaining capacity. This capacity shall be attributable in a very short time thanks to modern and fully digital IT tools.
Digital Capacity Management- an integrated IT solution, connecting the systems of IMs and RUs and facilitating the complete management process, from advance planning to the train run, will help in making TTR in all of Europe a reality.

With **construction works** growing significantly in order to repair and enhance Europe's rail network, all the processes described above could be at an increased risk by late and/ or uncoordinated changes. Thus, an essential element of all phases is the integration of work/maintenance and traffic. This can only function if a common European planning approach is adopted, bound by regulations on a European level.

https://rne.eu/capacity-management/ttr/media/

Why do we need a regulation for TTR?

Capacity is still currently managed with a focus first and foremost on national needs. Despite an existing EU directive, capacity management continues to be handled differently in each member state, even if each national network is trying to solve the similar problems.

The new Timetable Redesign (TTR) approach sets the ground for legal certainty and a common implementation. **Without a common approach, the existing national processes will remain in force, perpetuating today's patchwork for years to come** – frustrating the expectations of the end-users of railways that claim for sustainable transport modes and enhanced cross-border connections.

Every actor needs to be encouraged through the right set of **regulatory measures, enabling the transition to the new processes as soon as possible**, so as to ensure a balance between, reserving capacity for construction works and providing capacity when the real needs are known.

By having a regulation, all actors will have a sound basis and motivation to act together and with common goals and serve the end users of the railways in an increasingly interconnected Europe.

What are the gains of a European capacity regulation for shippers and member states?

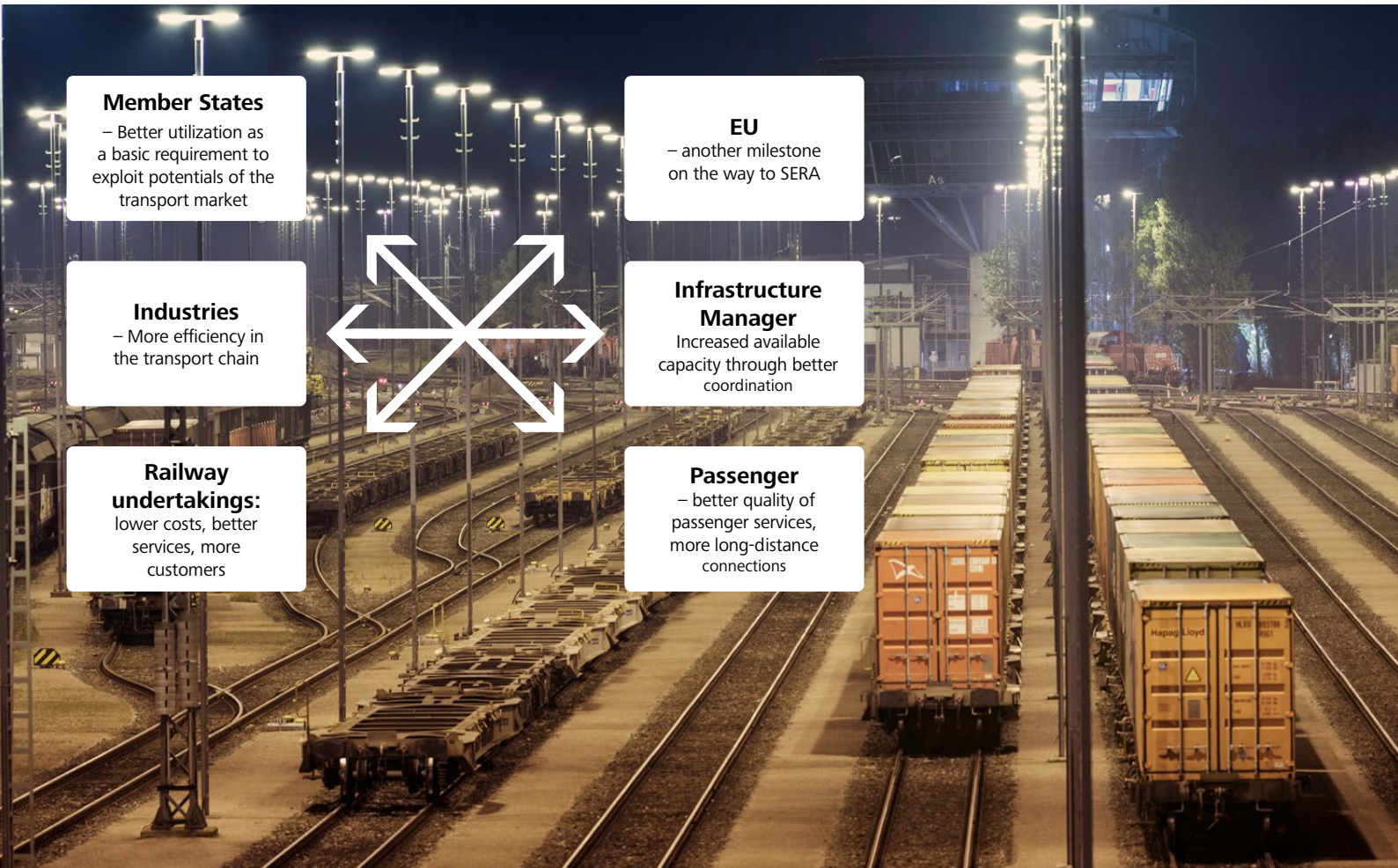
All actors benefit from the availability of more capacity to the extent that processes are coordinated on the European level. National guidance for capacity management in the railways, must stem from the strategic high-level elements that will allow coordinated use of European capacity.

- **New built** infrastructure and capacity will continue to be needed, though often confronted with long throughput times and high capital intensity. There will be continuous competition for the allocation of limited financial budgets.
- **Therefore we need to make better use of existing physical capacity** and thus better use of public and private financial resources through a smart management of the scarce available capacity, according to TTR process. This is a future oriented management system that sets the ground to optimize capacity when new and modernized infrastructure becomes available, but it is much needed now in order to draw from what the network has to offer.

Better use of the existing capacity can only be achieved by adapted European regulation with true European rules.

- By applying the new rules, an increase of capacity of up to 4% is expected, representing nearly **250 million train km of additional capacity**.
- This additional **capacity** for shippers and passengers requires **very limited investment**.
- **Capacity gains across borders** is a prerequisite to extend international **passenger and freight** train services, and at least retain exist¬ing services that face an unlevel playing field with other modes for any decades now.
- **Via the new rules, the negative impacts of maintenance or larger construction works** on domestic economies could be mitigated.
- **Capacity conflicts** could be solved in a harmonized way by defining rules of priorization taking social-economic and environmental criteria into account, once they have been properly tested.

Estimated additional production costs for railway undertakings due to reroutings reach **16 EUR/ train km**. Unplanned and unharmonized construction works make member states bear the financial consequences in the end.



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