CORCAP:
TRANSNATIONAL CORRIDOR CAPITALISATION STRATEGY

EXPLOITING POTENCIALS OF THE O-EM CORRIDOR FOR FREIGHT TRANSPORT AND REGIONAL DEVELOPMENT (D.T3.4.3)

Version 1
28 02 2022

A. PREAMBULUM: ABOUT THE CONTEXT OF THE CORRIDORS

Beginning of the corridor approach in Europe: it was the period 1975-1995 when the thinking about the corridors evolved in network level

The need for a common European transport policy was mooted when the Treaty of Rome was being written, but Future Development of a Common Transport Policy (CTP 1992), that is the first Union White Paper on the subject, did not appear until 1992. It had been preceded by numerous regulations or guidelines of a transport nature, but their common attribute had only been a concern with creating **competition neutrality**. They included such important measures as scrapping of ship cargo capacity, mandatory rest periods for vehicle drivers, and similar matters, but they did not amount to a single *transport-policy approach*.

The first rise of a kind of European-level corridor thinking appeared in 1975 when the European Agreement on Main International Traffic Arteries (Multilateral European Agreement AGR 1975) renumbered the international E-road network, cancelling the earlier numbering that followed a London-centred rayon system starting each main E-roads in London, and introduced a grid system instead. As the Article 2 of the treaty writes: "The international E-road network **consists of a grid system of reference roads** having a general north-south and west-east orientation; it includes also intermediate roads located between the reference roads and branch, link and connecting roads."

East-West orientation roads were numbering as E 20, E 30 etc; while north-south orientation roads were numbering as E 05, E 15 etc. No roads were constructed directly with that action, but **the mental view was changed**, how the European international road network was considered. (see *Figure 6 on page 9.*)

During the eighties, the European plans already dealt with multimodal corridors, involving the other transport modes into the action. By the time of the Maastricht Treaty and the first Common Transport Policy of the EU (CTP 1992) this led to the appearance of the TEN— the **Trans-European Network**—providing EU-level trunk connections not only in transport (TEN-T), but also in energy (TEN-E) and telecommunications (TEN-C).

By the time the ideas appeared in EU documents in 1992, the map of Europe had changed. In 1989 the Berlin Wall collapsed, the Iron Curtain disappeared, and it became clear that one had to think in terms of a larger Europe. The process of approving the TEN-T-concepts had been taking its Union course, and parallel with that, there began in 1991 a process of negotiations called the Pan-European transport conference, in which (1991: Prague, 1994: Crete, 1997: Helsinki) delegates of respective transport ministries accepted plans for the so-called "Helsinki corridors" or "Pan-European corridors", i. e. the **Eastern extension of the TEN-T**.

Eastern extension of the TEN-T should give a network similar to *Figure P-1*, extending the same type of grid network to a wider area.

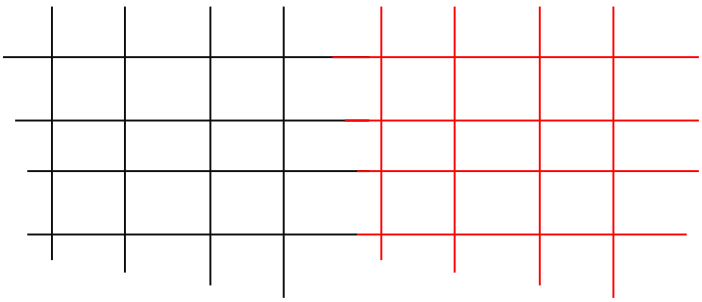


Figure P-1. Theoretical scheme of an extended uniform TEN-T network

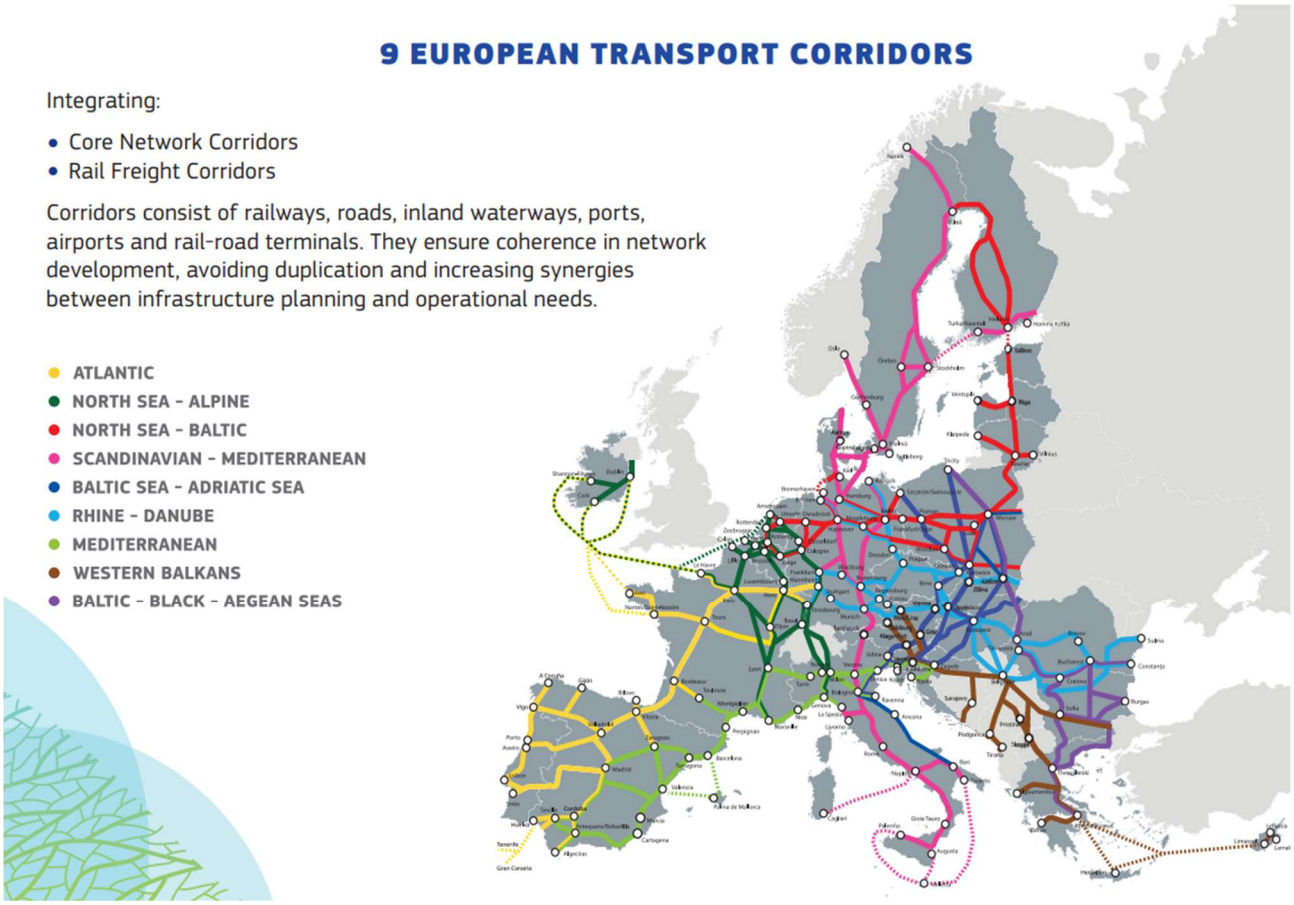
What really happened was different: instead of the extension of the grid, rather **the east-west corridors were extended towards the east**, urged by both the western and the eastern governments. There is another variant, because the eastern side of Europe has different geography and topography than that of the western one: partly the eastern part is larger toward the north and the south; and the main axes not necessarily follow the east-west and north-south directions. Naturally, the grid system could be twisted with 45 degree, or as far as necessary; it would still be a grid system. Neither of the possibilities were declared, the comprehensive network level planning is missing, and in the last 25 years it has been changed to a separate corridor thinking.

Multimodal TEN-T corridors: from 1996 on the EU has focused on the construction of 14, later 29 corridors and the network approach lagged behind this single corridor approach

The newest European Union document about the corridors is the Factsheet that appeared on the 14th of December 2021. (Creating a Green and Efficient TEN-T 2021). This document repeats the main objectives of the network (*The EU's transport network should be safer, more sustainable, faster and more convenient for its users*), inserting the approach into the frame of the new Sustainable and Smart Mobility Strategy of the EU (COM(2020) 789 final). "The network will be made greener, more efficient, and more resilient."

Out of the present and the planned characteristics of the network in numbers, the factsheet introduces a single map, with the integrated Core Network Corridors and the Rail Freight Corridors. "They ensure coherence in network development, avoiding duplication and increasing synergies between infrastructure planning and operational needs" *(Figure P-2*).

This map consists of nine corridors, These corridors more-or-less correspond in name and positions to the rail freight corridors, but especially the Orient–East Mediterranean is missing, perhaps because of the 'avoiding duplication' principle.



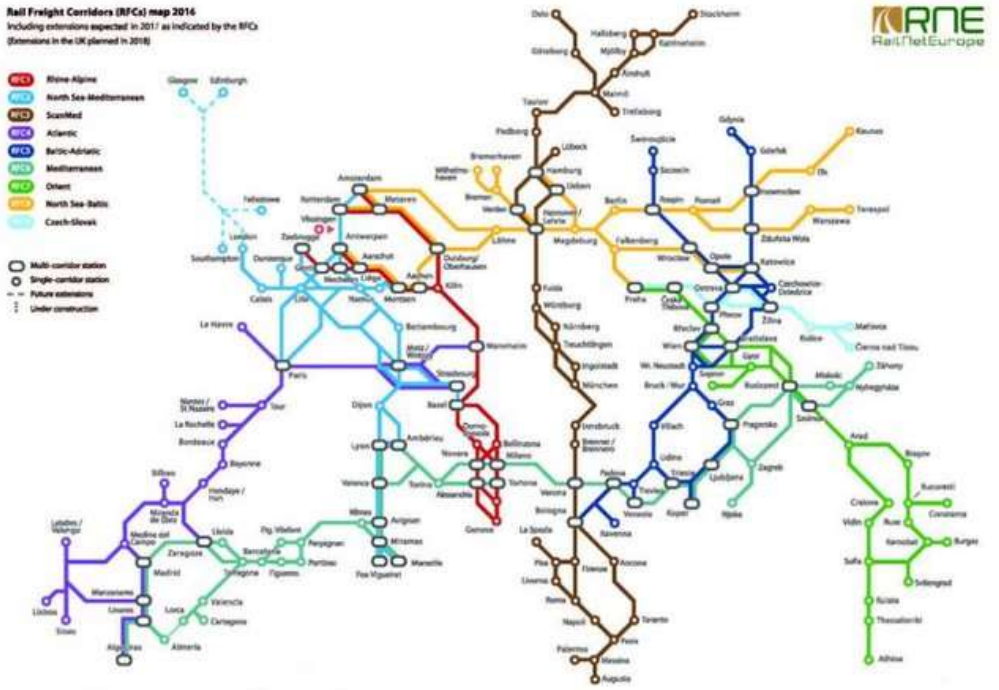
Source: Creating a Green and Efficient TEN-T (2021)

Figure P-2. Nine European transport corridors (2021)

Railway freight corridors: instead of the officially declared infrastructure based freight rail network design, practically the corridor planning deals with support of selected train routes between specific destinations

It was the Regulation (EU) No 913/2010 of the European Parliament and the Council of 22 September 2010 that established the rules for selection, organisation, management and the indicative investment planning of the European freight corridors. This document was exchanged three years later on Regulation (EU) No 1316/2013.

"The Annex of the next Regulation defines nine freight corridors, six of which were to be established by November 2013 and three by November 2015. Regulation (EU) No 1316/2013 establishing the Connecting Europe Facility amended the routes of the initial freight corridors with the aim of aligning these with the trans-European Transport Network core network corridors created by that Regulation." (MOVE/A3/2017-257 (2020) p. 51.) (*Figure P-3.*). „In January 2017, the Commission adopted an implementing decision regarding the creation of the "Amber" freight corridor and in March 2018 an implementing decision18 regarding the creation of the "Alpine - Western Balkans" freight corridor." (MOVE/A3/2017-257 (2020) p. 51.) (See *Figure 5. on page 8.*)



Source: Rail Freight Corridors (RFCs) map 2018: including extensions expected in 2020 as indicated by the RFCs **https://cms.rne.eu/rail-freight-corridors**

Figure P-3. Nine rail freight corridors (2016)

In the case of the first corridors we could see **the intention of fitting these ones to the north-south and the west-east directions**. The position of the Iberian peninsula explains that both the north-south (Atlantic) and the east-west (Mediterranean) corridors change to a northeast-southwest direction. More difficult to explain why the Atlantic corridor turn to east and goes to Strasbourg and Mannheim; while a next north-south corridor (North Sea-Mediterranean) crossing it to continue the Atlantic line to the north (London and Edinburgh). Also difficult to explain why the Baltic-Adriatic corridor fills up practically two parallel axes at a distance from each other that are normally fits to two corridors. Interesting that while two east-west corridors follow the two seasides (North Sea-Baltic and Mediterranean) in between there was no other east-west corridor planned.

Just this last problem was fixed with the Rhine-Danube corridor ((See *Figure 5. on page 8.*)) that stops at the Rhine instead of arriving to the Atlantic (the missing section is called Atlantic corridor).

As for the other corrections of the system, a bigger part of it is a kind of **duplication of the existing corridors**, where the already existing freight corridor becomes part of another corridor too. Another sections are short bypasses of already existing corridors, appointing more and more sections to be freight corridor. By that the middle part of Central Europe seems to be overloaded with fright corridors, while the original principles of the fright corridor network system seems to be lost.

If we see the Orient-East Mediterranean corridor in this system, the majority of it is a replication of other named freight corridors. The Ceská Trebová–Nové Zámky section is a bypass of other nearby corridor sections – if necessary also could be part of other corridors. A relatively longer single section is the Bulgarian and Greek southern end – but this section could be also part of a north-south corridor consisting of the eastern branch of the Amber corridor and ending in the Baltic north-south section.

All this shows that the network thinking and principles has been lost behind the newer development of the freight rail corridor plans, instead of it different pressure groups try to appoint routes for themselves naming it as freight rail corridor. **It would be useful to turn back to the infrastructure network content** of the

topic, and to de-sign the necessary grid that ensure the access to the network in each part of the union and Europe. This revision also need rethinking the shape of the grid in the eastern part of the continent: whether the north-south and east-west orientation is the good basis for this grid, or rather a 45 degree switched grid would is a better starting point.

As same as the mental effect of the grid was a useful help in 1975 for further de-sign of the corridor system, now also it would be useful to turn back to the geometric, geographical and topologic level of the grid design.

The relation is not clarified between the high-speed passenger rail lines and the rail freight corridors. Goods transport needs are frequently used to enforce the arguments in favour of constructing the high-speed-rail infrastructure

High-speed rail connection needs starting and destination points placed in high-density urban areas, and also need special tracks making possible the extra high speed. The time spent with travelling can be shortened first-of-all by the high speed and the good approach of the potential destination points.

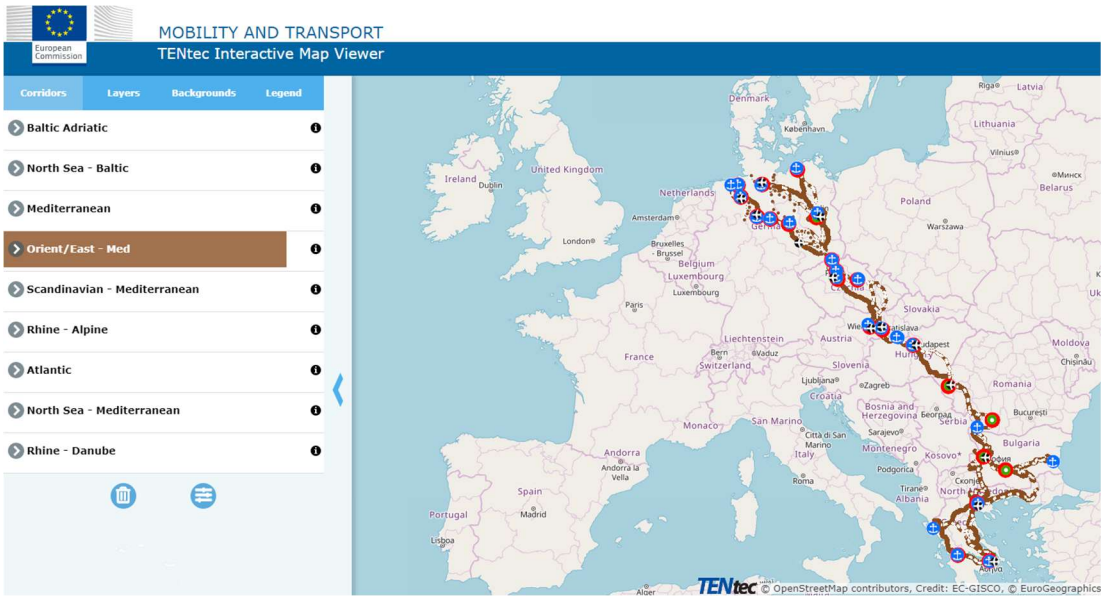
For a freight rail corridor it is a disadvantage to cross highly populated areas, big local traffic; and the **time spent with transporting can be shortened first-of-all with the better organisation at the specific handling points**, where the goods are standing in the 70-90% of the total transport time. Higher speed possibility can shorten but within the 10-30 percent of the time, when the goods are in motion.

High-speed rail needs special wagons that fit to the expensive rail construction, and the transport also needs paying the higher using fee of the special track, that can increase the cost of the freight transport.

In the biggest part of the total transport time of the goods, they are standing somewhere. Ensuring higher speed on the rail is a limited and expensive possibility of gaining time: much bigger source of it is the better organisation both at the endpoints and during the transport

B. WHY DO WE NEED THE O-EM CORRIDOR?

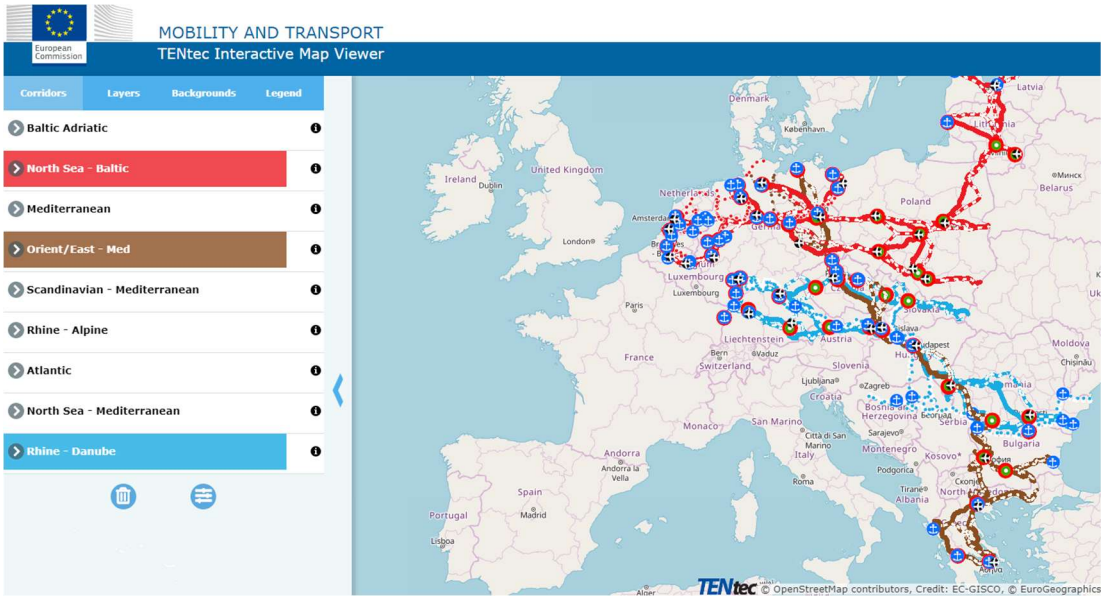
Figure 1 shows the Orient–East-Mediterranean (O-EM) transport corridor, the topic of the project. This corridor connects North Sea (and the south-western end of the Baltic Sea) with the Eastern Mediterranean area, ending in Greece and Bulgaria. The source of the map, (and that of several next maps too), is the TENtec Interactive Map Viewer of the European Commission, Mobility and Transport DG (TENtec 2021). Each corridor is multimodal, therefore motorways, navigable inland river flows and railways are all appearing on the interactive map. The corridor alignment is referred to be based on the Regulation (EU) 2021/1153 of the European Parliament and of the Council of 7 July 2021 (albeit two newly added corridors are missing from the map).



Source:TENtec Interactive Map Viewer. EC Mobility and Transport https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html?corridor=4&layer=8,9

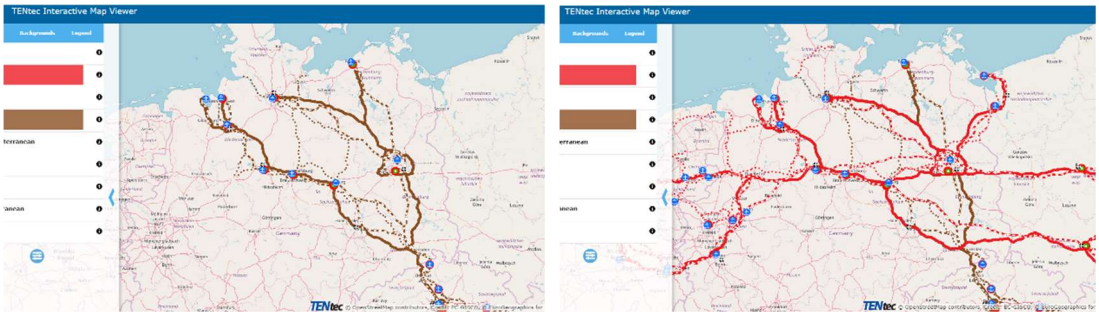
Figure 1. The Orient - East-Mediterranean corridor

Figure 2 shows O-EM corridor plus the North Sea – Baltic (NS-B) and the Rhine – Danube (R-D) corridors too. It is striking that two-third of the OEM corridor is overlapped by sections of these other two corridors. Even if NS-B corridor itself basically perpendicular to the O-EM corridor, it is not just a crossing section where they cover each other, but both are using the same tracks on a longer section. As for the R-D corridor, here even the main orientation is very close to those of the O-EM corridor.



Source:TENtec Interactive Map Viewer. EC Mobility and Transport https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html?corridor=4&layer=8,9

Figure 2. The Orient - East-Mediterranean, the North Sea - Baltic and the Rhine - Danube corridors

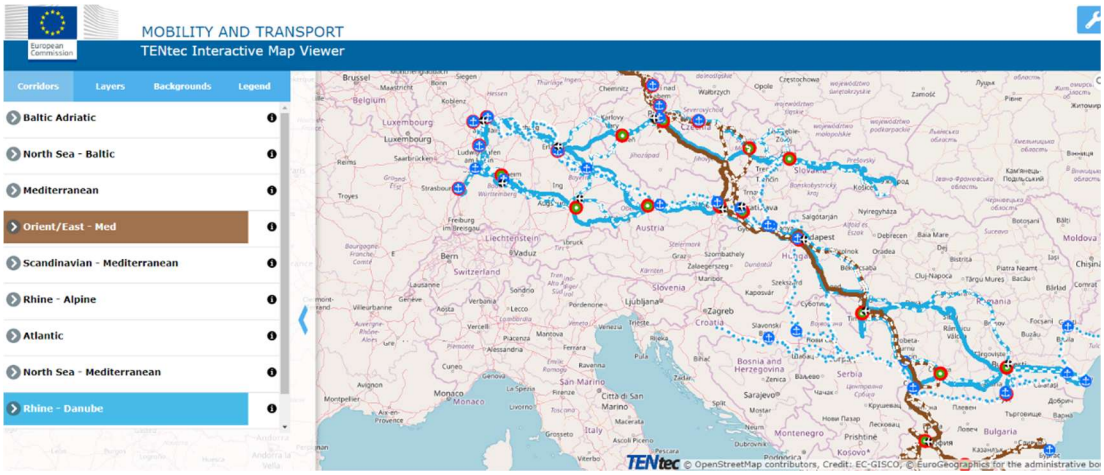


Source:TENtec Interactive Map Viewer. EC Mobility and Transport https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html?corridor=4&layer=8,9

Figure 3a and 3b. The O-EM, and the O-EM plus NS-B corridors

Figure 3a and 3b show the German section of O-EM and NS-B corridors, to make it clear that to the north of Dresden, there are but two short sections of the O-EM corridor not overlapped also by the NS-B. – If it is really necessary, naturally their development could also be handled by involving them into the NS-B corridor. If we speak about infrastructure corridors, it has no sense to mix it with delegated routes between origin and destination points that are using the same infrastructure.

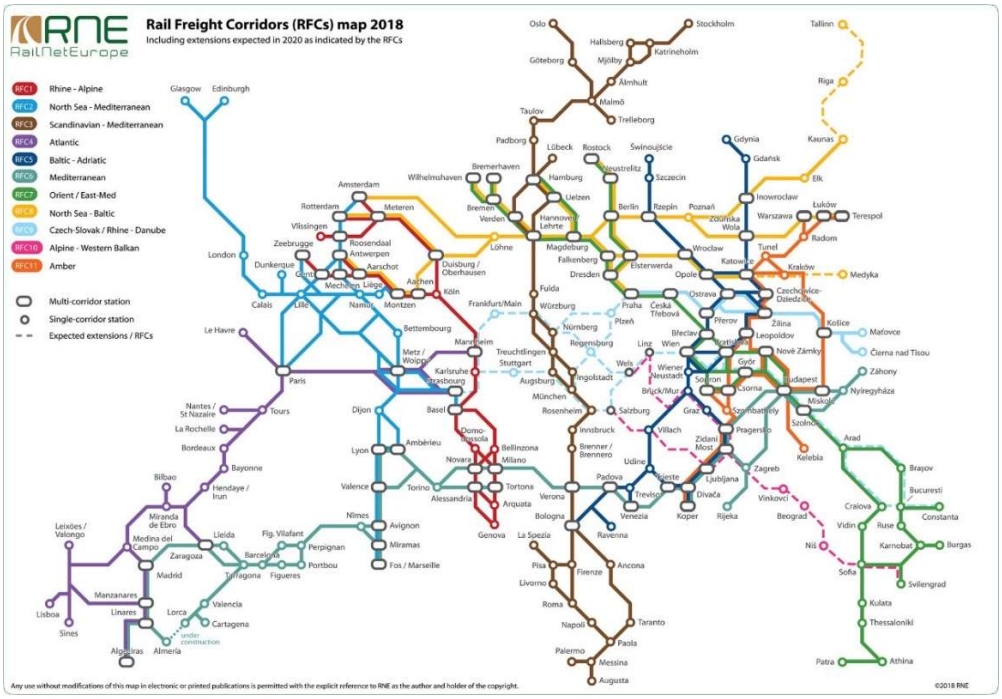
South of Dresden evidently there is a section until Prague, not overlapped by another corridor but used by O-EM. Between Prague and Calafat (Romania, at the border of Bulgaria) the O-EM corridor is again duplicated by the R-D corridor, as *Figure 4.* shows. (It wasn't necessary to present two maps here, as the two corridors can be distinguished even when they go together.) The section that is not covered by the R-D corridor, if necessary, could be part of that too. The main question is that why there are duplicated corridors in this area, while other big areas are not touched by corridors at all.



Source:TENtec Interactive Map Viewer. EC Mobility and Transport https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html?corridor=4&layer=8,9

Figure 4. The O-EM and the Rhine-Danube corridors

The question emerged is not that the single infrastructure sections of the O-EM corridor are necessary for the rail freight or not. What happened is that the comprehensive infrastructure-network based thinking seems to be disappearing behind the corridor projects. By now pressure groups supporting specific rail freight routes are appearing with new corridor ideas, and instead of upgrading the missing link that needed for their route, they try rather achieving the addition of a new corridor to the earlier ones, supported by the Commission. *Figure 5* presents the rail freight corridors including the Alpine – Western Balkan (A-WB) and the Amber (Amb) corridors suggested in 2020.



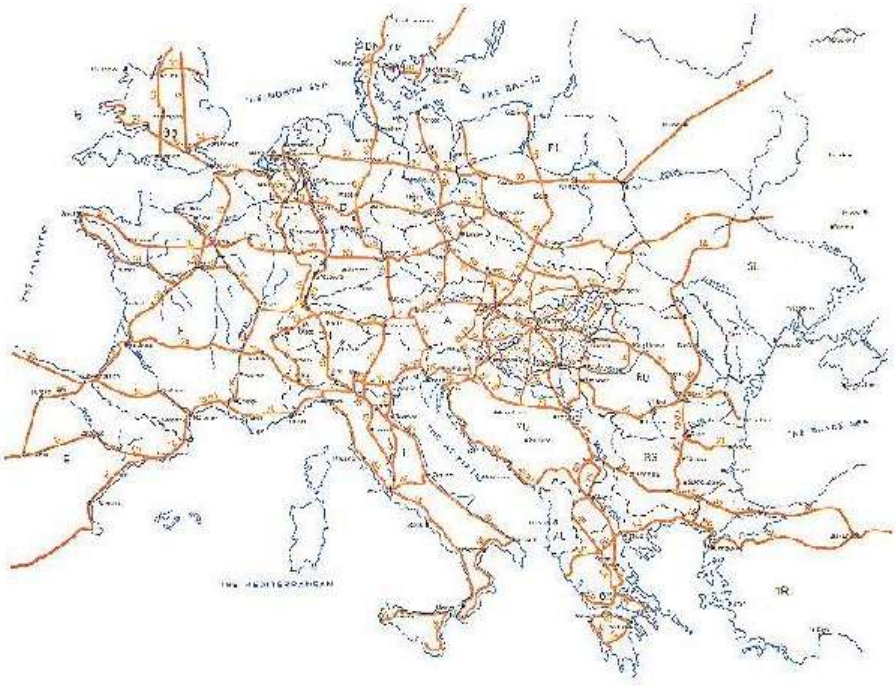
Source: Rail Freight Corridors (RFCs) map 2018: including extensions expected in 2020 as indicated by the RFCs **https://cms.rne.eu/rail-freight-corridors**

Figure 5. Eleven rail freight corridors (2021)

At the western side of Europe one can discover the trace of a once decided grid system with north-south and east-west corridors (and with a definite change of the orientation at the Iberian Peninsula), and a kind of rhythm to cover evenly the surface with corridors. At the same time on the eastern side of the EU the corridors seem to be locating randomly, without a systematic order, showing a chaotic set rather than a grid system. The question is not that the north-south and east-west orientation should be followed at any price: perhaps a 45-degree twisted grid fit better to the contour and topology of this territory. Neither 0 and 90 degrees, nor 45-degree grid orientation was decided and planned, as same as no suggested distance between the declared corridors was determined as desired. Presumably the intentional avoiding of certain areas (e.g., Western Balkan) could also cause higher density at the used area; but the basic problem is that never the expected future grid were planned for the whole area.

There is a historical example showing that the revision of the network approach is never too late. The first rise of a kind of European-level corridor thinking appeared in 1975 when the European Agreement on Main International Traffic Arteries (Multilateral European Agreement AGR 1875) renumbered the international E-road network, cancelling the earlier numbering that followed a London-centred rayon system starting each main E-roads in London, and introduced a grid system instead. As the Article 2 of the treaty writes: "The international E-road network consists of a grid system of reference roads having a general north-south and west-east orientation; it includes also intermediate roads located between the reference roads and branch, link and connecting roads."

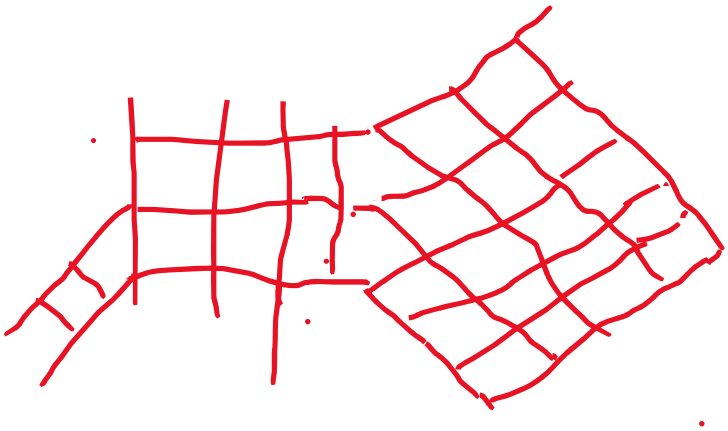
East-West orientation roads were numbering as E 20, E 30 etc; while north-south orientation roads were numbering as E 05, E 15 etc. No road was constructed immediately with that action, but the mental view was changed, how the European international road network was considered. (*Figure 6*)



Source: Az országos közúthálózat 1991-2000 évekre szóló-fejlesztési programja 1991, KHVM

Figure 6. The birth of corridor thinking, renumbering the roads in 1975

By now, it is clear that for the whole EU of the 27s or more, considering the shape and form of the continent, not a simple north-south and east-west grid but a more complicated one is able to cover the whole territory. *Figure 7.* below is just a formal solution showing the possibility to follow the irregular contour to be covered. Naturally, as same as in the earlier cases, the existing railway lines and the planned multimodal corridors should be the platform where the grid edges can be selected first. At the same time the denomination of the corridors mustn't be a barrier: e.g., the east-west section of the Atlantic (AT) corridor between Paris and Mannheim fits better to the R-D corridor that stops at the Rhine now but can be prolonged to become an Atlantic-Danube (or Black Sea?) corridor.



Source: Own draft

Figure 7. A theoretical draft of the grid that able to cover the European area

The lesson one can learn from the above description is that it is necessary to rethink the transport corridor system of the EU and Europe at a network level. Presumably such a rethinking wouldn't result basic change just along a line that currently is part of several corridors, among others that of the O-EM corridor. So, it is hopefully not a needless activity to analyse the problems and search for the possibilities of the improvements along this rail freight corridor in the frame of the CORCAP project.

C. ENHANCING THE FUNCTIONALITY OF THE CORRIDOR - RESULTS AND FINDINGS FROM CORRIDOR CAPITALISATION PLANS

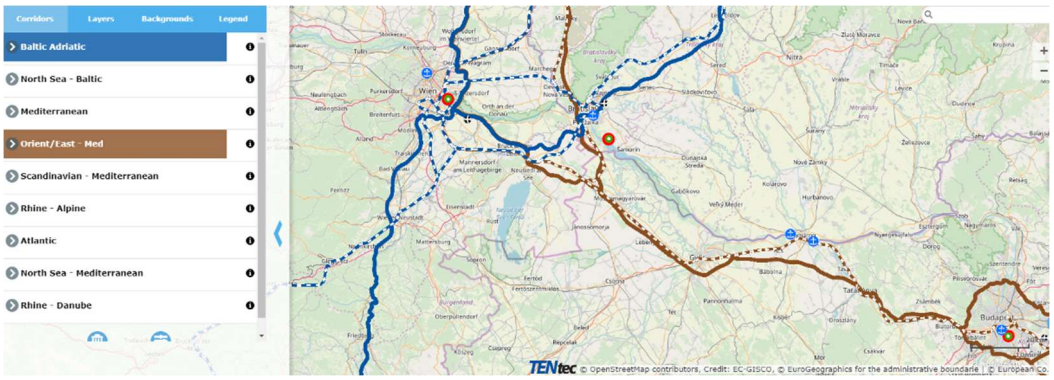
A.1. Győr-Moson-Sopron and Burgenland region

KTI Institute for Transport Sciences develops a corridor capitalisation action plan for the Győr-Sopron-Burgenland Region, taking into account the results and findings of D.T1.2.6 (Regional analysis of challenges and needs for the Győr-Sopron-Burgenland Region) and

O.T1.2. (Decision-support tool specifying and prioritising pilot actions for multimodal freight transport complementing O-EM corridor development). The document is jointly prepared with PP9 GYSEV, the main natural key stakeholders in the area, the regional rail company operating on cross-border and other corridor sections.

In line with CORCAP project's main aims, the *general objective* is to support the development of a sustainable and attractive living and economic environment in Western Hungary and Burgenland province. From the logistic sector's side this aim can supported by better positioning and enhancing the functionality of the corridor through improved coordination between transport and spatial planning. Specific, freight transport based international objective is to eliminate bottlenecks in the region on the route of the transit traffic.

Transportation plays a significant role in the economic structure of Győr-Moson-Sopron County. The main transport axes are interconnecting the urban centres along the county and offer also multimodal connections with the neighbouring counties toward the south and international connections towards west and by crossing a north-south corridor in the region too. (*Figure 8.*) As for Burgenland, all their main rail lines are international, leading towards Bratislava, Győr, Sopron and Szentgotthárd.



Source:TENtec Interactive Map Viewer. EC Mobility and Transport https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html?corridor=4&layer=8,9

Figure 8 The Orient/East-Med and the Baltic-Adriatic Core Network Corridors in the Vienna – Bratislava – Budapest area (dashed lines are railways)

In the same time, in Győr-Moson-Sopron county, there are infrastructural bottlenecks in the case of all transport modes. The inland water transport corridor lost its significance for the bigger part of the county since the main branch of the Danube was lead at a bypass line in Slovakia. There are also missing links on the rail and road network.

During the elaboration the corridor capitalisation project the team surveyed the related strategic documents dealing with the region, with special regard to the transport issues. In these documents, there are several projects listed for the future or ongoing developments, all of them targeting the improvement of the multimodal traffic flows, including the creation of intermodal connections. The documents also deal with the problems of the cross-border links. To embrace international and intermodal cooperation these links need to be emphasised more soon. Development of a digital infrastructure can also enhance the cooperation between national logistics providers and infrastructure operators, which can ultimately facilitate the faster and more efficient greener intermodal transport.

As a general objection mentioned, the development projects need a more positive connection to environmentally friendly transportation solutions or intent to the usage of alternative energy sources. Another problem is that the corridor approach handle the local network and the regional life as a secondary issue, and not as a boundary condition.

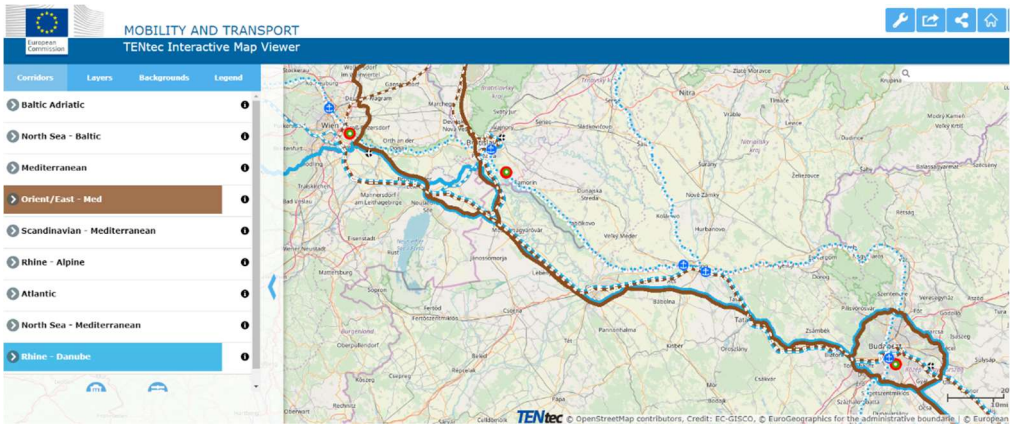
While rules are markedly laid down, prescribing that development resources need to be managed by a complex method, to achieve the best synergy between the economy, transport and the environment, the declared aim is still to systematize transport networks, transhipment points and logistics centres in order to eliminate existing bottlenecks and increase the level of service.

The necessary activity focused to the main transport sectors and to the corridors, setting aside even the secondary transport needs:

- Inland waterway development's main problem the Danube safe- and economical navigability in Hungarian river section, which is not a national/regional but an international development task. The role of Hungarian Danube ports strongly depends on this factor. The most important port in the region, the Győr-Gönyű Port has very good rail- and road connection and it is a logistics centre too. Close to the design area in Komarom/Komarno, both cities have river ports with good road and rail connections, and can play an important role in both sides in the rail-waterway relation.

- As for the road sector, the expressway network is almost complete (M1, M15, M85, M86), M83 is being built, the only missing part: is the M85–A3 cross-border section between Sopron and Eisenstadt. The condition of the highway network kept appropriate; and there is planned upgrade and capacity increase of the M1 expressway Budapest-Győr section. There is a local development task for the CORCAP project: to create a new road connection to the Sopron Logistics Centre without disturbing the city's daily life.

- The railway network has greater development needs. Formally there are three Rail Freight Corridors (RFCs) passing through the Western Hungary region. These are: RFC 7 Orient/East-Med, RFC 9 Rhine-Danube and RFC 11 Amber corridors, but as *Figure 9* shows there is no difference on this Hungarian section between RFC 7 and RFC 9.



Source:TENtec Interactive Map Viewer. EC Mobility and Transport https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html?corridor=4&layer=8,9

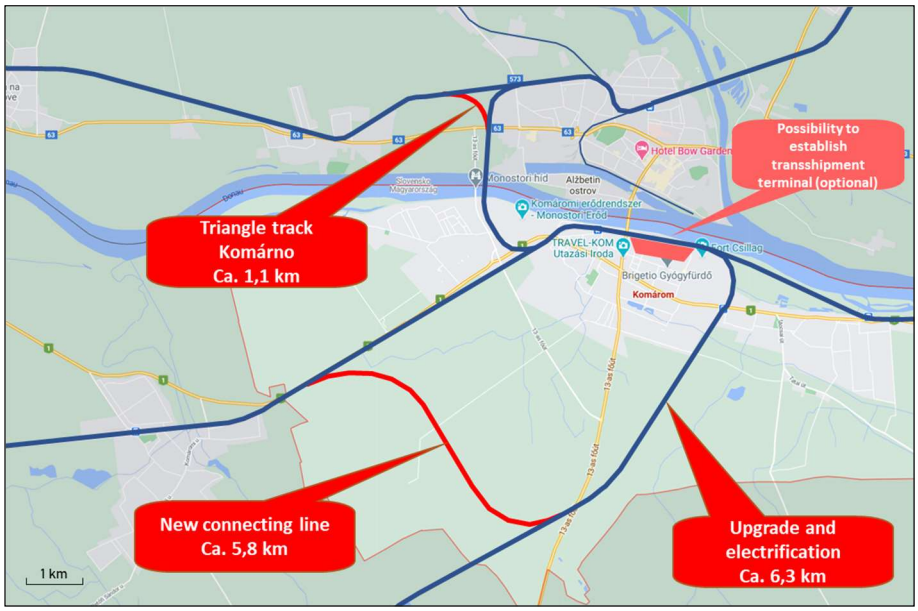
Figure 9 There is no difference between the RFC 7 (Orient/East-Med) and the RFC 9 (Rhine-Danube) Core Network Corridors in this Hungarian section

The aim of the RFCs is to promote rail freight and increase its share on the continent. The CORCAP project aims to promote environmentally friendly freight transport. The proposed main actions are removing line bottlenecks, station and border station improvements and removal of operational and administrative barriers.

The neuralgic point of the railway traffic is the station Győr and to some extent Sopron. Győr cannot be by-passed by rail, so the capacity of the station is a key issue in the train traffic.

Lack of a triangle track in Ebenfurth, forcing all train between Sopron and Vienna to change their direction of travel. This also applies to practically all freight trains. Similar problems emerge in Győr and in the Komárom / Komarno area (plus in Zalaszentivan for Baltic-Adriatic traffic). would significantly increase the capacity and level of service not only on Corcap corridor, but also in the North-South connections of the wider area.

Even if it is just between the Győr-Moson-Sopron region and the Budapest region, very important to mention the Komarom / Komarno delta problem. *Figure 10.* presents the situation, based on the CORCAP Corridor Capitalisation Plan for the Győr-Sopron-Burgenland region D.T3.2.6 Version 1.0. On the Slovak side there is a possibility for the construction of a short triangle track of ca. 1,1 km length west of Komárno station. On the Hungarian side a triangle track directly connecting the Komárno–Komárom line with the Komárom–Győr line would become excessively expensive due to built-up areas and to a new road. Thus, on the Hungarian side the suggested solution is a new connecting line of about 6 kilometres over open field between the Győr–Komárom line and the Székesfehérvár–Komárom line approaching Komárom from the south.



Source: CORCAP Corridor Capitalisation Plan for the Győr-Sopron-Burgenland region D.T3.2.6 Version 1.0

Figure 10. Proposed developments of the rail infrastructure in the Komárom-Komárno node. Shown alignments are indicative

The problem with this suggested solution is that the Győr–Székesfehérvár or Győr–Komárom–Székesfehérvár connection is also a needed and planned corridor construction and part of the Budapest bypassing planned V0 railway line. That is why it is necessary to study if this six km long connecting line with another delta towards the south, or a

longer connecting line would be optimal to handle both the Komárom delta and the Győr–Székesfehérvár problems. This issue leads over to the Budapest region and its bypass possibilities.

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Closing the West Hungarian section, the development ideas and plans related to Győr-Moson-Sopron County can serve the objectives of CORCAP well, while a few smaller additional plans are needed to achieve the goals. The study also proved that more attention should be attend not only to the Austrian relations of GYMS County, but also to the Slovak relations.

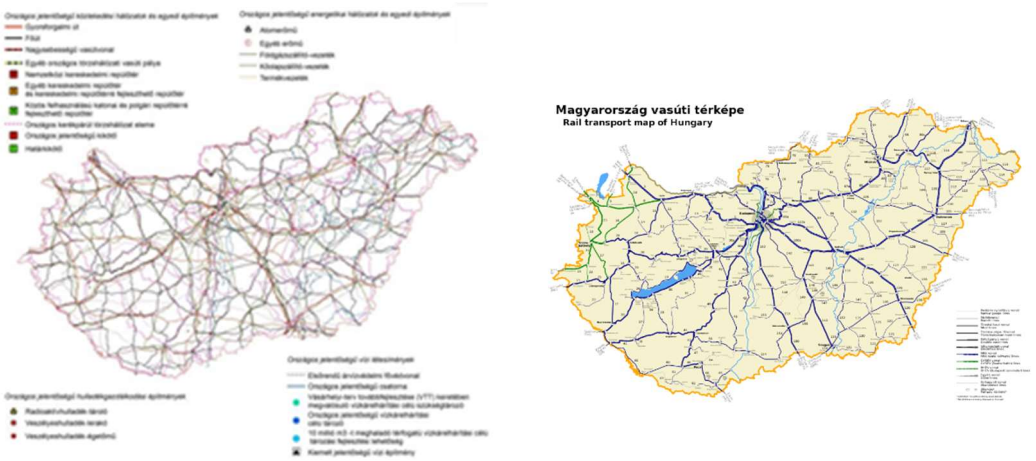
A.2. Budapest region

According to the CORCAP project's Application Form, a Corridor Capitalisation Plan was elaborated for the Budapest Region – based on the results and findings of the Regional analysis of challenges and needs for the Budapest Region (D.T1.2.7) and the output of Decision-support tool specifying and prioritising pilot actions for multimodal freight transport complementing OEM corridor development (O.T1.2). The 'Corridor Capitalisation Plan for the Budapest Region' document has been prepared by the Freeport of Budapest Logistics and KTI Institute for Transport Sciences.

The approach followed by the project aims to develop integrated strategies focusing on the interaction between regional development and transport infrastructure development, taking into account the operational requirements of multimodal logistics sites and transport services as well. Through the improvement of the connectivity of intermodal hubs and inland ports and the investigation of innovative intermodal services, tangible benefits will be delivered for more efficient freight transport solutions.

Pest county covers only 7,4 % of the territory of Hungary, while one-third of the Hungarian population lives here, and nearly half of the national GDP production is concentrated in the Budapest Functional Urban Area. To promote the economic concentration, specific economic zones for high-tech industries innovation and logistics have been designated, especially to the south of Budapest, around the M0 southern ring-road.

Figure 11. presents the transport network of Hungary (OTRT 2016) and separately also the rail network of the country. The aim of this illustration is to point out **the overcentralised structure of the main transport networks** that cause pressure at the Budapest region, namely pushing through the majority of the transit (through) traffic on the region that is heavily loaded already by the suburban and local transport. All those traffic using the corridors with no destination within the region can best contribute to the liveability of the Budapest conurbation, if able to bypass the area. The creation of such a bypass possibility is therefore an emphasised aim of the region.



Source: http://www.terport.hu/sites/default/files/imagecache/tematikusfull/169_of_otrt_muszinf_.jpg and https://hu.wikipedia.org/wiki/Magyarorsz%C3%A1g_k%C3%B6zleked%C3%A9se#/media/F%C3%A1jl:Magyarorsz%C3%A1g_vas%C3%BAti_t%C3%A9rk%C3%A9pe.svg

Figure 11. Transport networks of Hungary and rail network of Hungary

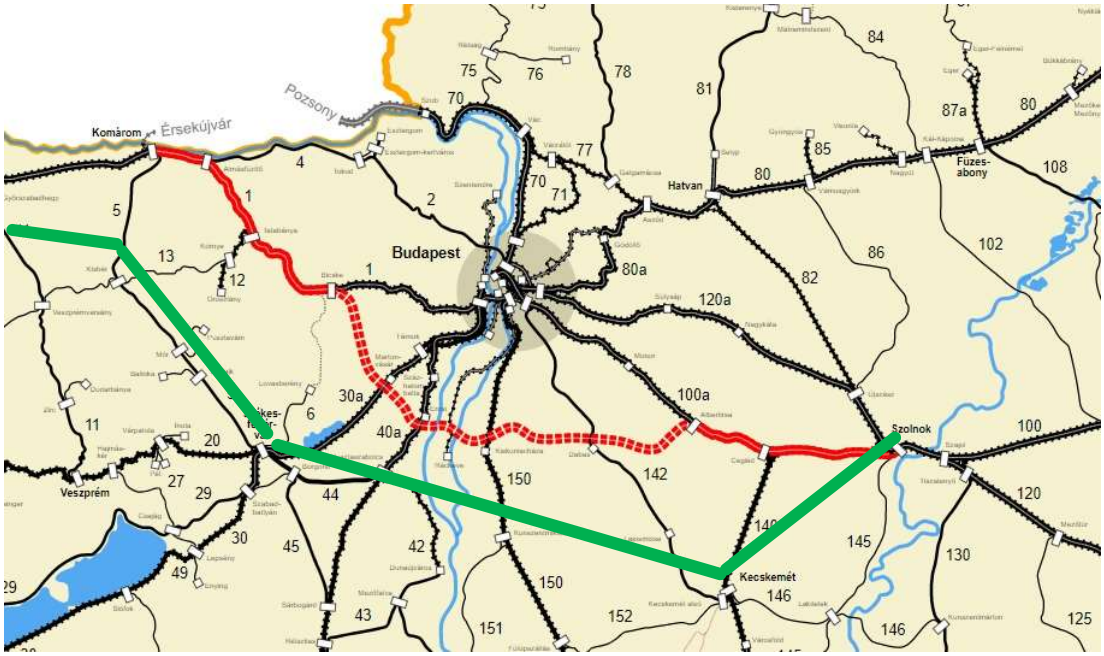
Another problem of the region is the **excessive dominance of the road transport** in the case of both passenger and freight traffic. That is why the region needs a development and improvement in the circumstances of the railed transport and the creation of the bypass at the same time. Especially in the case of the rail freight corridor a next problem is that out of the natural dense of the destination points in the urban area, here are there the Danube port and the biggest airport and the biggest marshalling yard of the country too, not mentioning the significant logistic and container centre. The earlier plans considered these points as fixed givens and suggested even the bypassing V0 rail section placing very close to the capital. A study in 2013 suggested variant IV for implementation (Figure 12.) A feasibility study was also prepared, and planned to be constructing with Chinese credit. The plan was to build a 113 km long section, on two tracks, allowing speeds of up to 160 km per hour. Only freight trains would have run on the line, to decentralize domestic rail traffic. (Molnár Z 2021)

Source: Berki Zsolt et al (2013)

Figure 12. Envisaged V0 variants for railway bypass of Budapest (2013)

In the subsequent years, the capacity limit problem of the Budapest based passenger trains gained priority, and therefore the construction of the southern circular railway within the capital received more support. Emphasis was given to the supporting arguments that the construction of the third track through the urban area would also solve the capacity problem for the freight trains. For a few years the bypass track V0 was removed from the agenda.

After this silence around the V0, in March 2021 preparations have started again, with an environmental impact study, a feasibility study and a cost-benefit analysis. The calculations of the logistic centres showed that the expansion of the Southern Round Railway alone would not be enough, for the projected increase of the rail traffic the V0 would be needed. Still in May, the tender for the V0 plan was cancelled, and there has been silence on the subject again. (Molnár Z 2021)



Source: AzÜzlet.hu (2021) with added line

Figure 13. The first articles presented the earlier supported (red) line in 2021 too. Recently one can hear about the search of a Székesfehérvár-Kecskemét-Szolnok connection for the V0. Green line shows the possible zone the corridor may lead

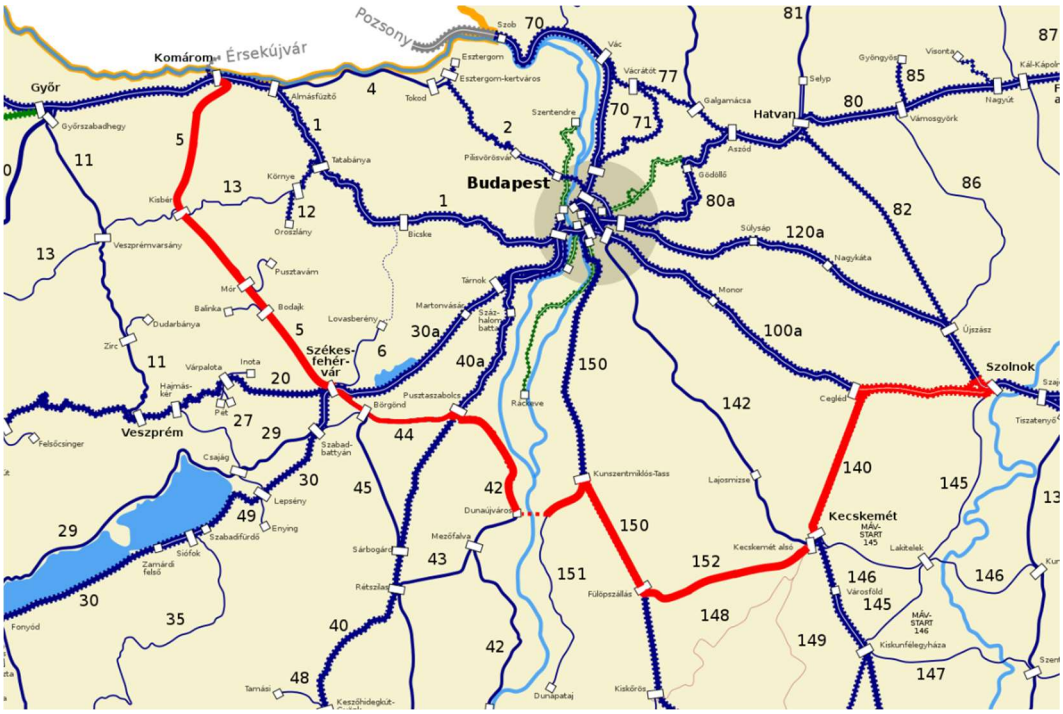
In January, 2022 a new turn appeared in the story. According to an article in iho.hu, "in addition to sharing their experience and expertise, the Russians were also open to examining the possibility of contributing to the financing of the project". (Mégis lesz V0? 2022)

It was Minister of Innovation and Technology, László Palkovics who highlighted the new framework. "Fulfilling the priority goal of the railway program, Hungary can become the freight, logistics and distribution centre of Central Europe if it benefits as much as possible from the trade of goods between Europe and Asia. The modernization of the capacity expansion of the Budapest-Belgrade railway line, which is already underway, offers a faster route to the mainland for goods entering Greek ports. Thanks to the V0, rail shipments arriving by land from the Far East can travel through Hungary without the time-consuming crossing of the capital. The environmental permit for the investment from the south of Budapest may be available next spring, and a feasibility study may be completed by the summer of 2023." (Molnár Z 2022)

(Worthy to mention that such arguments as 'become the freight, logistics and distribution centre of Central Europe' are not necessarily in harmony with a declared environment-friendly and low-emission vision of regions. Worthy to mention too, that the bulk Chinese 'goods entering Greek ports' are partly may be the same future goods that seems to appear in Koper when the construction of the Amber corridor needs

support, or seems to appear in Constanza to help arguing the growing need for the **Danube transport; and also an argument in the development of the Záhony / Fényeslitke** zone at the Ukraine-Hungarian border.) Anyhow, the V0 is a potential common section of the O-EM (plus the same Rhine–Baltic) and of their crossing not yet denominated Russia–Ukraine–Hungary-West-Balkan potential corridor.

The generous V0 plans can be compared to a minimalist rail freight bypass route recommended by a non-governmental organization (Figure 14.), where, except for the Danube crossing, the plan uses existing railway sections to be renovated. Obviously, the Danube bridge needs to be positioned in such a way that it can serve a more generous V0 solution if needed in the future. (Pgeri MKK 2021)



Source: Pgeri MKK (2021)

Figure 14. Civil suggestion for a bypass fright railway line using each existing rail sections

Both in the case of the cheap or the officially suggested solution, an important advantage is that reaching Székesfehérvár or Szolnok the railway organisation can replace the marshalling yard function of Budapest,

The main general objective for Budapest by the ‚Budapest Long-term Urban Development Concept 2030' and also by the 'Budapest Mobility Plan' is to support the creation of liveable, attractive, sustainable and at the same time economically efficient living and enterprising environment in Budapest area. This aim is in line with the European Green Deal, to create a climate neutral Europe in the coming decades and reach the goal set by 2050.

The specific aims of the Corridor Capitalisation Plan of the Budapest region are the followings:

1.	Exploit the untapped potential of the O-EM corridor (by creating better intermodal node out of the most loaded area of the Budapest region).
2.	Facilitate modal shift from road to rail and waterborne transport, thus strengthening the share of environmentally friendly freight transport methods.
3.	Resolve the existing bottlenecks of the railway fright network by upgrading the existing bypass possibilities and construction the V0 bypass railway section to facilitate the macro-regional traffic flow.
4.	Substituting the shunting yards along the bypass line (upgrading the Székesfehérvár and Szolnok marshalling yards).
5.	Satisfying the narrowed logistic demand for the local supply of the Budapest region and for the growing passenger train service.
6.	Strengthening cooperation among the stakeholders concerned for the implementation of accurately timed and harmonised improvement actions.

The above suggested development goals are to be achieved by specific projects. In the frame of a thematic workshop experts collected the most important projects described in the national and regional development strategies (especially in Budapest Rail Node Study 'BRNS') foreseen to be implemented in the coming two decades in the Budapest region. These project ideas were grouped with the suggested development goals to find solutions for the identified challenges.

The next table control if the goals together are really able to cover the answers to the challenges.

CHALLENGES GOALS .	Improvements of the circumstances of the surrounding area (A)	Interoperability of a functional urban area (I)	Railway infrastructure developments (R)	Management and development of marshalling yards and areas related to railway technology (M)	Raising awareness of different stakeholder groups (RA)	Financing issues (F)
Achieve better intermodal node facility out of the most loaded area of the Budapest region	X	X	X	X		
Facilitate modal shift from road to rail and waterborne transport		X	X	X		
Substituting the shunting yards along the bypass line (upgrading the Székesfehérvár and Szolnok marshalling yards).			X	X		
Resolve the existing bottlenecks of the railway fright network by upgrading			X			

the existing bypass possibilities and construction the V0 bypass railway section to facilitate the macro-regional traffic flow.						
Satisfying the narrowed logistic demand for the local supply of the Budapest region and for the passenger traffic	X	X	X			
Strengthening cooperation among the stakeholders	X	X		X	X	X

After fixing the list of the project ideas, they have been ranked into three action plan scenarios.

The first scenario is based on the 'Business as Usual' principle, only supporting the use and patching of the current transport system and the decisions in the current official and valid passed documents.

The second scenario "New Plans from the Budapest Rail Node Strategy" is based on the newly finished government-based plan on the Budapest Conurbation Rail Strategy, (that focus first of all on the passenger transport).

In the case of the third scenario "Rail Freight Development" all measures are collected and implemented that are necessary for the service of the local and the corridor-based freight operations.

These three scenarios are extreme models of specific approaches, namely representing the 'no focus' the 'passenger focus' and the 'freight focus' activities. The scenarios are not suitable to choose from, but their combination and appropriate weighting can be used to create a realistic program.

D. Summary

A significant part of the O-EM corridor is common to other rail freight corridors. This draws attention to the fact that the designation of corridors is not really in line with the original objective, they do not represent priority infrastructure corridors, but rather provide pathways for connections that are considered important on the infrastructure network.

The mapping of the corridors also draws attention to the fact that the eleven dedicated rail freight corridors do not form a network that evenly covers the European area (or even the European Union), but show unjustified densities, both multiple-covered and under-covered areas. The whole system needs to be reviewed.

Nonetheless, it is a sensible question, what are the obstacles to rail freight transport along the areas connected by the North Sea and the Eastern Mediterranean, ie the O-EM corridor, – and how can these be overcome.

In general, it can be said that speeding up and making freight transport more predictable cannot be managed by significantly improving the speed of travel, because the time losses of the transport arise primarily in places where the goods are standing, waiting. Besides to the points of departure and arrival, the main delay-causing points are the urban hubs where significant local traffic obstructs the passage of freight trains. The freight corridor must preferably avoid these hubs, ie the larger cities affected by the route. It should also be ensured that such hubs do not have to be touched for railway operation and ordering purposes either, by goods otherwise passing through. The establishment of the connection 'V0' bypassing Budapest is included in the CORCAP Budapest region study as a proposal for this.

Another characteristic cause of delays during travel is forced reversing, because of the lack of delta tracks. The CORCAP West-Hungary--Burgenland study suggests several such improvement in the Ebenfurth, Wulkaprodersdorf, Zalalövő and Komárom areas; and also a similar proposal for improving the Győr--Székesfehérvár connection is included in the CORCAP Budapest region.

The listed development needs also draw attention to the fact that it is not at all justified to link the designation of rail freight corridors with the development of high-speed railway lines, because in the case of the latter the goal is to speed up the open line sections and reach the metropolitan hotspots.

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