European Railway Agency, 2006

ERA

MUNUC 36

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Dear Delegates,

Welcome to MUNUC 36! My name is Hugh Barringer, and I am excited to serve as your chair for the European Railway Agency, 2006. As your chair, I will be guiding your debate throughout the conference as your ideas turn from working papers into resolutions and helping you improve your writing, public speaking, and persuasion prowess over the course of the conference.

A bit about me. I am double majoring in Business Economics and Political Science. I am originally from the DC area. I am also involved with ChoMUN, UChicago's college MUN conference; the blue chips, an investment club; and I have ridden the entire subway system in Chicago in one run.

I hope that you are as excited as I am to chart the course for Europe's railways in the 21st century, bringing the European Union closer together in the process. Please, always remember to be respectful to your fellow delegates and the historical material. I am confident that we will have an awesome committee where everyone will have a great time and learn a lot.

Best,

Hugh Barringer

Chair, European Railway Agency 2006

hbarringer@uchicago.edu

Dear delegates:

Welcome to MUNUC! I'm Juan, and I am beyond excited to be one of your chairs for MUNUC 36. I am a third year majoring in Political Science and minoring in Human Rights and Astronomy in UChicago. I am excited to be a MUNUC exec for the second year in a row with my awesome co-chair Hugh, and we hope you are excited too! Fun might or might not come to die at UChicago, but Hugh and I hope to revive it for your MUNUC experience.

Here are a few things about me: I am from Colombia, although I have lived in the United States since 2013. I absolutely love aviation, soccer, and Formula 1- so if anyone wants to talk about any of those things during breaks, I am always down for it. On campus, I am also involved in (mostly) anything MUN (ask me about CHOMUN 2023's Chile 1810 committee and its landmark dynamics), the Society of International Relations, the Organization of Latin American Students, and the Undergraduate Law Magazine, among other things. When not studying or doing anything club related, I can be found playing or watching soccer, running, or complaining about the lack of mountains in Chicago (I miss the Colombian mountains of my youth).

I've been doing MUN since my freshman year of High School, and I have loved every aspect of it. MUN has always struck out to me not just because its themes generally match my professional interests, but because of its ability to bring people together to craft solutions. We understand if the nature of this Agency is new to you, as the European Railway Agency is a rather niche committee idea, but one that its spirit is of importance to all of us. But whether it is new to you or not, as in every other ModelUN committee, we strive to make you think of new ideas and solutions that can help the communities that surround us, especially in a topic that impacts all of us in transportation networks.

I trust you all to be both respectful to each other and the events we are simulating, and of course, never forget to treat others the way you want to be treated. Overall, Hugh's and I's goal is to provide you all with a committee that is as interesting as it is fun and educational. With that in mind, if you have any questions regarding the committee or its expectations, feel free to email us! For now, can't wait for you all to hop on board with this committee (ha ha ha)!

Sincerely,

Juan Leal-Mendoza

Chair, European Railway Agency 2006

jlealmendoza@uchicago.edu

Though the European Railway Agency (ERA) was established in 2004, the concept of an integrated European infrastructure is far older, going back to the late 1940s with the inception of the **European Coal and Steel Community**. However, neither the Coal Community nor the succeeding **European Economic Community** would attempt policy or economic integration of European railways until 1991, when the First Railway Package set continental licensing and management standards.[1] The European Commission thought this was only a start and pledged to work on further packages to improve the idealized standardization of European railways. This vision came to a climax through the EU's Second Railway Package, which included Regulation (EC) 881/2004, creating the European Railway Agency.

Regulation 881/2004's effect wasn't instantaneous as its framework gave two years for the ERA to become functional. The regulation established base guidelines to follow, but it took time to organize the bureaucratic power necessary to enforce them. In 2006, the ERA was founded to work under the mission of creating an open, sustainable, and safe railway system for Europe as a whole.[2] To that end, the agency was tasked with increasing the safety, interoperability and common maintenance driver training measures for the European train network. At the same time, ERA has to coordinate the implementation of these concepts in a way that is acceptable to the network's producers and its cargo and passenger customers. It's worth noting that some of these goals have also been advanced in the European Railway Packages, but the implementation of an agency to coordinate these tasks is an unprecedented step.

Today, the ERA seeks to achieve a world where "any European railway undertaking may operate services on any rail network in any country of the European Union" by removing technical barriers to interoperability.[3] This goes hand in hand with the 1991 Open Access policy: without strong unified standards surrounding things such as electrification, signaling, and coupling systems, competitors would be limited to single countries, falling well short of the ERA's vision of a single European railway network. Some steps have already been taken in this direction: directive 2001/16 set forth the goal of "the interoperability of the

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[1] Tunnicliffe, Andrew. "Timeline: Europe's Dream for a Single Railway, Two Decades In." *Railway Technology*, 14 Aug. 2019, railway-technology.com/features/rail-transport-in-europe/.

[2] "ERA's Vision, Mission, Values and Tasks." *European Union Agency for Railways*, 3 Feb. 2023, www.era.europa.eu/agency-you/agency/vision-mission-values-tasks.

[3] "European Rail Transport Policy." Federal Ministry for Digital and Transport, 9 Mar. 2021, bmdv.bund.de/EN/Topics/EU-Policy/EU-Transport-Policy/European-Rail-Transport-Policy/european-rail-transport-policy.html.

trans-European conventional rail system[4]. Therefore, it will be up to the ERA to devise these standards, opening the route to ample and safe competition while bringing the EU closer to achieving the goal of achieving a trans-European rail system.

Transport, and in particular rail, has always been a force for bringing people from distant places closer together. Improving Europe's rail network will not only strengthen the Union but also help the EU meet critical climate goals. In 2006, the opportunity to bring Europe closer together through rail service was especially potent due to the recent ascension of former Eastern bloc members.[5] If done wrong, this expansion could fray the connections between EU member states, but if done right, it can create an even stronger, more united, pan-European version of the EU. A comprehensive, high-quality, interoperable railway system will help strengthen these inter-EU bonds. We have full faith in the ERA's ability to create this highly connected system that will bring Europe closer together.

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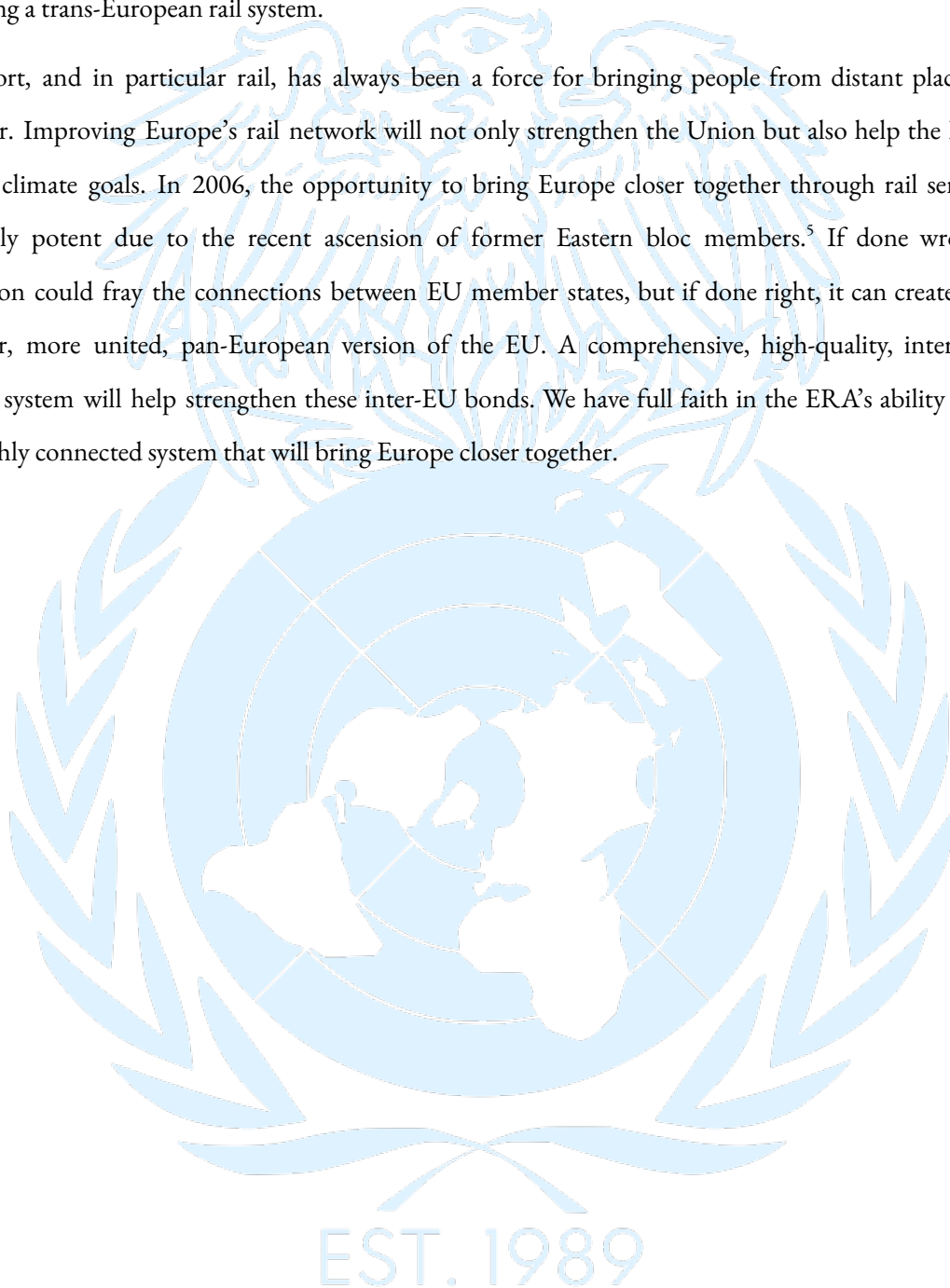
[4] "DIRECTIVE 2001/16/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL." *EUR-Lex.Europa.Eu*, 19 Mar. 2001, eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX%3A32001L0016%3AEN%3AHTML.

[5] De Munter, André. "The Enlargement of the Union." *Fact Sheets on the European Union*, Apr. 2023, www.europarl.europa.eu/factsheets/en/sheet/167/the-enlargement-of-the-union.

Statement Of The Problem

Figure 1. The European Railway Agency's headquarters in Valenciennes, France[6]

Per the European Railway Agency's (ERA) nature and mission, one of the agency's key goals is to improve intra-EU connectivity through trains and railways in an "open, sustainable, and safe" manner. ERA's organizational charter assigns it the powers to monitor the interoperability of the **European Union's** (EU) railroad network, clarify continental safety rules, harmonize national railway rules and establish

maintenance, training and safety standards.[7] These powers are managed through the organization's bureaucratic power, with measures decided by the organization's appointed representatives and then enforced under the context of the **European Common Market Area's** goal of removing continental trade and economic accessibility barriers so as to integrate the national markets of European Union member states into one large open common market. Yet, these objectives are much easier said than done, provided the vast challenges that the agency can identify throughout the continent.

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[6] SheffVal. *English: The Administrative Headquarters of the European Railway Agency*. August 14, 2011. Own work. https://commons.wikimedia.org/wiki/File:European_Railway_Agency_Headquarters,_Valenciennes.jpg.

[7] "REGULATION (EC) No 881/2004 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 29 April 2004 Establishing a European Railway Agency (Agency Regulation)." *EUR-Lex*, 29 Apr. 2023, eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32004R0881.

To this end, domestic and continental politics present a challenge. Each European country has specific interests to advance, particularly as it relates to organization, regulations and favored national companies. For example, different EU countries have different schedule focuses based on their domestic context. Higher density countries such as Belgium and the Czech Republic (which average at least 20 kilometers of railroads per 100 square kilometers in most regions of both countries) from prefer having a larger, yet slower fleet so the nation's railway network can attend the large yet densely situated cities within the small nations with as many services possible in a day. On the other hand, larger nations such as Spain and France (which some regions may average as low as at 0 to 5 kilometers of railroads per 100 square kilometers in most regions of both countries) prefer a decentralized high speed fleet so the more spread out larger cities can be covered in smaller times.[9] There are countries such as

Germany that have managed to implement both systems to maximize schedule efficiency in both rural and urban areas, however continental implementation is still a far cry. Dividing the makeup of the fleet in this way is great to cover different domestic needs, but becomes more complicated when regional considerations are taken into account, given both the different demographic patterns in the continent and the different infrastructure requirements each system requires (for instance, a high speed fleet requires specialized **"grade separated and electrified" rails**, which are both expensive and impractical for the conventional rails used in high density areas).[10] To integrate these two systems into a continental cooperation agreement would require much negotiating and compromise to ensure the commercial and consumer interests behind both types of train networks are respected.

Improving intra-EU connectedness would also require addressing disparate regulation and national interests in the tracks. For instance, as the 1990s have ended, European railway providers have been tasked with finding a system that lowers customs gaps and barriers during international trips. Up to that decade, **"through coaches"** were very common, which were train carts that were attached to one train and could be re-attached to another to ensure that the specific

[8] Freight train in Břeclav train station, Czech Republic March 1, 2015 https://commons.wikimedia.org/wiki/File:Sunday_Morning_at_Breclav_Station_-_Central_European_Railfreight_hub._Diesel-electric_Bo-Bo_CD_714_204-5.jpg.

[9] Alex. "European Rail Maps." *Vivid Maps*, 30 Sept. 2020, vividmaps.com/european-rail-maps/; Cerny, Philipp. "Rail: The Challenges of a Single European Railway Area." *Heinrich-Böll-Stiftung*, 3 Feb. 2021, eu.boell.org/en/rail-the-challenges-of-a-single-european-railway-area.

[10] HSR 101. "What Is Needed to Go Fast?" *High Speed Rail Alliance*, 25 Jan. 2023, hsrail.org/blog/what-is-needed-to-go-fast/.

carts could get to destinations that differ from the destination of the original.[11] Though this was great for customer comfort, it did not maximize schedule efficiency especially during international trips where different countries (and operators) have different agreements and pricing rates for this practice, all while needing to ensure that disparate train models work well together. As more countries, especially in Eastern Europe, continue working to integrate themselves into the European Union's Common Market and newer train models render through coaches obsolete, it's important for the committee to consider streamlining regulations by having agreements on customs practices, so as to create railroad operation protocols that satisfy the different railway needs, while emphasizing the European Union's single market goals.

It's worth noting that this logic must also be applied for maintenance and safety measures, two of the most important aspects of a safe and successful continental railway system. From staff training to material quality inspections to concise communication protocols, there are many dimensions towards guaranteeing the safety of individual trains and railways as a whole. Some providers, such as Italy's Rete Ferroviaria Italiana, have begun implementing new reliability analysis

based measures to maximize maintenance quality and security.[12] While these reforms have been helpful in modernizing Italian railroads, implementing systems like these across the continent can be challenging. From bureaucratic and status quo inertia to lack of access to funding required, and even instances of low-level corruption, there are many challenges that can hamper the implementation of critical upgrades to the system's practices. However, in a railway system as large as the EU's, the system can only be as strong as its weakest link. Therefore, it is important for the ERA to come to consensus on the integral starting points in its effort to improve infrastructure to ensure the continuous safety of its railway system, while at the same time ensuring that the Agency can do what it can to ensure each participating country can access the means required for its policy implementation.

Additionally, railway policy is not only competing with domestic and continental politics but also fighting an uphill battle for relevance against other modes of transportation in Europe, such as naval, car, and airplane based transportation. Trains are lagging significantly behind these three modes of transportation throughout the European Union for both cargo

[11] Cerny, Philipp. "Rail: The Challenges of a Single European Railway Area." *Heinrich-Böll-Stiftung*, 3 Feb. 2021, eu.boell.org/en/rail-the-challenges-of-a-single-european-railway-area.

[12] Macchi, Marco, et al. "Maintenance management of railway infrastructures based on reliability analysis." Reliability Engineering & System Safety, vol. 104, 2012, pp. 71-83, ISSN 0951-8320, https://www.sciencedirect.com/science/article/pii/S0951832012000518.

and passenger transportation. For cargo, as of 1998, rail **freight transport** accounted for only around 8% of the total freight transport in the European Union, far behind road transportation's 44% share and short sea transport's 41% share.[13] The story is similar when it comes to passenger transportation in the EU; as of 1995, air and car transportation compete with each other among different countries for the dominant mode of transportation among different EU countries (with air travel having a 90% share in Iceland and car having a 70% share in France), all while train consistently remains a secondary mode of passenger transport, with Italy having the largest share of train passenger transportation at a mere 10%.[14] These are alarmingly small numbers for an agency that was designed to affirm the importance of the railway as a major transportation means in Europe.

While these statistics may be a couple of years old, transportation patterns throughout the world have remained similar in the new millennium, both globally and regionally. Consumers continue to prefer other modes of transportation of the rail in the EU despite its clear benefits.

Modern rail transportation has now been studied and named by the EU's Environmental Agency as one of the greenest modes of transportation, having the least carbon emissions per kilometer alongside shipping.[15] Additionally, the EU's Transportation Safety Council named trains one of the safest modes of transportation alongside airplanes, with the two modes each sharing a low 0.035 deaths per 100 million person kilometers. When it comes to deaths per 100 million person travel hours, trains have the lowest rate at 2, compared to airplanes' 8.[16] It is true that both airplanes and shipping have benefits in different categories (ranging from lower costs to greater schedule availability, which the committee should note), yet train transportation is the only transportation mode that has a superb modern record for both performance and safety. Yet, this doesn't change its underuse in Europe compared to other modes of transport. For this to change, its policies and regulations must be streamlined to ensure ease of accessibility for customers. As long as railway based transportation remains underused, major benefits for European

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[13] "Freight Transportation: The European Market." *Office of International Programs* - U.S Department of Transportation, June 2002, international.fhwa.dot.gov/eurofreight.cfm.

[14] "International Tourism by Mode for Selected Countries, 1995." *European Environment Agency*, 12 Nov. 2009, eea.europa.eu/data-and-maps/figures/international-tourism-by-mode-for-selected-countries-1995.

[15] "Motorised Transport: Train, Plane, Road or Boat - Which Is Greenest?" *European Environment Agency*, 24 Mar. 2021, eea.europa.eu/highlights/motorised-transport-train-plane-road.

[16] "Transport Safety Performance in the EU – A Statistical Overview." *European Transport Safety Council*, 1 July 2003, etsc.eu/transport-safety-performance-in-the-eu-a-statistical-overview/.

interconnectedness remain untapped, which this committee ought to consider and correct.

History Of The Problem

The Development Of The European Railroad System

The European railroad heritage is immense and key to the continent's development. The first modern railroad in history was built in England in 1830, through which this transportation system and its consequential steam engine became linchpins of the nascent Industrial Revolution in both Britain and continental Europe.[17] The importance of railroads in Europe grew not just out of industrial innovation but also out of the benefits it provided to the continued growth of industries. For instance, the French government made railroads central to its strategy to make Paris the transportation hub for the French mainland. Meanwhile, Prussia made railroad construction central to aid in the rapid transfer of troops during the German Unification Wars.[18] It's worth noting that this growth in railway infrastructure remained highly divided between different countries. The railways' use in progressing nationalistic goals wasn't compatible with the concept of large-scale connectedness. Benito Mussolini, after all, did not "make the trains go in time" to advance European interconnectedness but rather to advance nationalist sentiment and strengthen the eventual World War II Italian War Machine.[19]

As the nationalism of World War II gave way to a more regionally conscious European continent, this change also slowly trickled down into railway attitudes, giving way to the first thoughts of a more interconnected Europe through railroads. The first major step towards this goal was undertaken in 1951, when the European Coal and Steel Community was established to create a Western European single market towards the two specified products. While this organization did not emphasize the use of railways towards these ends, it did foment the first steps towards European integration through railways by abolishing discriminatory railway tariffs throughout the Bloc.[20] Years later, the creation of the European Economic Community through the **Treaty of Rome** emphasized a deeper importance to the crossroads between common markets and transport policy; Title IV of said treaty focused on the implementation of a

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[17] Cha, Sung Jik. "Railroads in 19th Century Europe : Great Britain, France, Germany, and Russia." *WHKMLA*, May 2008, www.zum.de/whkmla/sp/0910/csj/csj1.html.

[18] Ibid.

[19] Pike, John. "Mussolini: The Trains Ran on Time." GlobalSecurity.Org, 15 Nov. 2011, www.globalsecurity.org/military/world/europe/it-trains-ran-on-time.htm.

[20] Mathieu, Gilbert. "'The History of the ECSC: Good Times and Bad' from Le Monde (9 May 1970)." *CVCE.EU by Université Du Luxembourg*, 5 July 2016, www.cvce.eu/obj/the_history_of_the_ecsc_good_times_and_bad_from_le_monde_9_may_1970-en-54f09b32-1b0c-4060-afb3-5e475dcafda8.html.

common transport policy for the organization's members.[21] As far as railways were concerned, this title emphasized fair competitive conditions among the various domestic rail markets, and ensured freedom of providing services.[22] Yet, advocates for the European Economic Community noted that further railway harmonization required a significantly deeper policy angle. Policy issues included addressing challenges running from addressing disparate national laws; creating unified administrative practices; and ensuring adequate social and environmental practices throughout the continent. These were all tasks that required more detailed and specific legislation towards railways, as most actions enacted by the Coal and Steel Community and the Common Market Community were broad so it could cover air, land, and sea transportation in a catch-all manner, rather than specifying separate policies for different transportation methods.

Figure 3. Mid-20th century freight train in Tirano, Italy[23]

The Need For Railway Integration

While baby steps were taken towards railway integration throughout the Cold War, there were problems that persisted that indicated the importance of harmonizing these efforts even further. These organizations gave general frameworks to initiate the process of integration, particularly as it relates to fair market competition, but aimed little towards specific issues seen in the European railways system. For instance, one of the historic problems this system faced throughout the Cold War and beyond was the lack of cross-border coordination. This has affected both passenger and cargo transportation, as the lack of regional coordination has affected the record-keeping and documentation of both passenger and cargo loads through international

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[21] "TRAITÉ Instituant La Communauté Économique Européenne et Documents Annexes." *EUR-Lex.Europa.Eu*, 25 Mar. 1957, eur-lex.europa.eu/legal-content/FR/TXT/PDF/?uri=CELEX:11957E/TXT.

[22] Pernice, Davide. "Common Transport Policy: Overview." *Fact Sheets on the European Union*, Apr. 2023, europarl.europa.eu/factsheets/en/sheet/123/common-transport-policy-overview.

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[23] Photograph. Pxfuel https://www.pxfuel.com/en/free-photo-ebhkf.

borders.[24] The cargo sector has had a better record improving this, as the **European Goods Train Timetable Conference** (or EKG Conference for short) of 1951 began coordinating the recordkeeping of European goods trains, and updated their recordkeeping in 1961 to better track their movement.[25] For passenger trains this has lagged significantly behind as the EKG conference discussed the possibility of creating a unified **ticketing system**, but wasn't implemented until two decades later in the 1970's when most of Western Europe agreed to use a singular ticket reservation system: West Germany's Elektronische PlatzAnweisung (EPA). Today, most countries have either merged or linked their system to the EPA, but it is not standardized across Europe. For example, France retains their own ticketing system (RESARAIL) and many former Eastern Bloc countries aspiring to become EU members are working to update their railway procedures to Western technological, transportation and structural standards–a process that will take years and more

funding to complete.[26] Furthermore, there was still a lack of consistency when it came to tracking passenger volume numbers, agreement of proper passenger train procedure, and many other issues plaguing European rails that ultimately led to a greater momentum towards integration reforms.

Figure 4. A modern European Railway Agency's office in Lille, France[27]

Modern Railway Initiatives

The partially integrated status quo persisted throughout the next few decades, all while the system's inefficiencies remained apparent and European integration took even greater strength during the 1980s and 1990s. This combination had led to a reduced market share for major European train providers as other more flexible

[24] Saralegui, María Elorza, and Helena Rodríguez. "Why Is Train Travel so Unpopular in Europe?" *euronews*, 20 Apr. 2022, euronews.com/green/2022/04/15/european-train-travel-isn-t-as-popular-as-it-should-be-here-s-why

[25] "FTE History." *Forum Train Europe FTE*, forumtraineurope.eu/organisation/forum-train-europe/history/.

[26] Danny. "Ticket Distribution: The Failure of Railways to Sell Themselves." *Trip By Trip*, 17 Mar. 2018, tripbytrip.org/2018/03/17/ticket-distribution-the-failure-of-railways-to-sell-themselves/.

[27] Tai, Kaihsu. English: En:European Railway Agency Lille. November 15, 2009. Own work. https://commons.wikimedia.org/wiki/File:European_Railway_Agency_Lille.JPG.

transportation modes adapted well to the changing transportation landscape, and ultimately train transportation suffered financially as a whole as it accumulated high levels of debt.[28] At first, individual European countries began working to reform their train industries with the goal of bringing back the railway's competitiveness and standardizing the infrastructure and service operations related to railways. However, it was not until 1991 that the European Union began speaking as a unified bloc to create bloc-wide railway legislation that various directives were introduced to address major aspects in continental railway policy, such as the interoperability of the growing **High Speed Rail Network** and streamlining the **rights to network access** policy (which defines who and what providers are allowed to operate in the railways under jurisdiction), catalyzing the start of the European Union's formal involvement in railway policy. These directives would be followed by the First Railway Package in 2001, and the Second Railway Package in 2004 (including Directive 881/2004, which established the European Railway Agency), thus signifying an unprecedented level of involvement of the EU in regional railway policy.[29]

This newfound involvement became increasingly important as these reforms coincided with the preamble of the EU's expansion to Eastern Europe. After the Iron Curtain fell for good in 1989, previously communist and/or neutral countries began looking westward to the EU. This began with the admission of previously neutral Finland, Sweden, and Austria in 1995, and picked up pace with the admission of former communist countries such as (but not limited to) Poland, Estonia, Slovenia, and Hungary in 2004, with Romania and Bulgaria expected to join in the near future.[30] This means that an area that encompasses half of the continent has just joined the new bloc, leading to a regional effort to help bring these new countries up to Western European standards–including in railway transportation. These new member states face various challenges to catch up which include reorganizing their railroad infrastructure so as to allow for new private and public providers to enter their network and ensuring their network investment and regulatory frameworks work with those used by the rest of the union.[31] Former communist states in particular will also have to

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[28] Holvad, Torben. "Review of Railway Policy Reforms in Europe." *Built Environment (1978-)*, vol. 35, no. 1, 2009, pp. 24–42. JSTOR, http://www.jstor.org/stable/23289642.

[29] Ibid.

[30] De Munter, André. "The Enlargement of the Union." *Fact Sheets on the European Union*, Apr. 2023, www.europarl.europa.eu/factsheets/en/sheet/167/the-enlargement-of-the-union.

[31] Tánczos, Katalin, and György Bessenyei. "East European Rail: The State of the Network." *Built Environment (1978-)*, vol. 35, no. 1, 2009, pp. 136–48. JSTOR, http://www.jstor.org/stable/23289649.

address the change in their network operations from one based on central planning and the movement of industry to a decentralized network focused on the balance between passenger and cargo traffic.[32] These reforms are important not just because they are part of the commitment involved with being an EU state but also to fast-track ambitious upgrade projects the bloc wants to advance in the region, such as the **Trans-European Railway (TER) project**, which hopes to modernize the railway equipment used in Eastern and Central Europe.[33] Due to the mass scale and funding needed for such projects, they need a commitment from the continent as a whole in order to succeed, which ought to be coordinated by the designated EU agency for such endeavors: the European Railway Agency.

Past Actions

Date of Adoption	Directive / Regulation	Subjects
Initial reform attempts		
29/07/1991	91/440/EEC	Development of the Community's railways incl. limited rights of network access
19/06/1995	95/18/EC	Licensing of railway undertakings
19/06/1995	95/19/EC	Allocation of railway infrastructure capacity and the charging of infrastructure fees
23/07/1996	96/48/EC	Interoperability for trans-European high-speed rail
The 'First Railway Package'		
26/02/2001	2001/12/EC	Amending Directive 91/440 – for the opening-up to competition of the international rail freight market
26/02/2001	2001/13/EC	Amending Directive 95/18 – extending the licensing principle to all railway undertakings
26/02/2001	2001/14/EC	Repealing Directive 95/19 – Allocation of railway infrastructure capacity, the levying of charges for the use of railway infrastructure and safety certification
19/03/2001	2001/16/EC	Interoperability for trans-European conventional rail
The 'Second Railway Package'		
29/04/2004	881/2004/EC	Establishment of the European Railway Agency
29/04/2004	2004/49/EC	Railway Safety Directive
29/04/2004	2004/50/EC	Amending Directives 96/48 and 2001/16 – Interoperability of the conventional and high-speed trans-European railway network
29/04/2004	2004/51/EC	Amending 91/440 – complete opening of rail freight network in the EU from 1 January 2007

Figure 5. Summary of EU Railway Legislation, 1991-2004[34]

As of the last decade and a half, the European Union has enacted a well-documented effort towards furthering European integration through railroads. Though most nations have still worked independently to advance their own railway networks–particularly to expand High Speed Rail Network in Western European countries–the more technical and regulative components of railway policy have been outsourced to the European Union. This has mostly come through legislative action, given the uptick in railroad legislation going through the European Commission since the end of the Cold War and the rapid Eastward expansion of the Bloc.

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[32] The World Bank. "Railway Reform in the Western Balkans." European Commission, Mobility and Transport, Dec. 2005, pp. 9-12, transport.ec.europa.eu/system/files/2016-09/2005_world_bank_western_balkans_railways_report.pdf.

[33] "Trans-European Railway (TER) Project : Report on Activities Implemented in the First Half of 2004." *United Nations*, 9 Aug. 2004, https://digitallibrary.un.org/record/527680?ln=en.

[34] Holvad, Torben. "Review of Railway Policy Reforms in Europe." Built Environment (1978-) 35, no. 1 (2009): 24–42. https://www.jstor.org/stable/23289642.

Most of this legislation has focused on improving the accessibility and competitiveness of new providers in the existing network and advancing security and technical reforms in a uniform manner, with the goal of advancing an European single market.[35] As described previously, there have been two other major periods of railroad policy reform in the EU beyond the initial 1990s directives: the **First and Second Railway Packages**.

In 1998, the **European Commission** introduced its first coordinated bundle of three railway policy directives. This bundle focused on sustaining the impartiality of charges and infrastructure use, so a non-discriminatory and competitive use of conventional railway lines could be encouraged for both cargo and passenger transport providers.[36] These proposed reforms sparked extensive debate in both the European Council and Parliament due to their regional importance but ultimately were approved and passed in 2001, formally enacting the first European Railway Package.[37] These policy directives were well received, signifying important progress towards service **interoperability** standardization. Notably, Directive 2001/12/EC required that **"independent organizational entities"** must organize the management of infrastructure and operation in each given states, while that Directive and Directive 2001/13/EC established uniform requirements from which a national railway cargo transportation license could be acquired and be used in any of EU's member states.[38] Yet, there was still much more work to be done for railways to regain the competitiveness in Europe, especially as the EU was expanding eastwards and looking to integrate the markets of former Eastern Bloc countries in the near future as they inched closer towards the standards of accession.

Therefore, in January 2002, the European Commission proposed a Second Railway Package, which focused on creating a **Single European Railway Area** through interoperability improvements, while also integrating freight into the EU's vast internal markets.[39] It also brought unprecedented safety reforms through Directive 2004/49/EC, which ensured national safety certificates were applicable throughout the entirety of the bloc,

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[35] Holvad, Torben. "Review of Railway Policy Reforms in Europe." *Built Environment (1978-)*, vol. 35, no. 1, 2009, pp. 24–42. JSTOR, http://www.jstor.org/stable/23289642

[36] "First Railway Package of 2001." *European Commission - Mobility and Transport*, transport.ec.europa.eu/transport-modes/rail/railway-packages/first-railway-package-2001_en.

[37] Holvad, Torben. "Review of Railway Policy Reforms in Europe." *Built Environment (1978-)*, vol. 35, no. 1, 2009, pp. 24–42. JSTOR, http://www.jstor.org/stable/23289642

[38] Ibid.

[39] "Second Railway Package of 2004." *European Commission - Mobility and Transport*, https://transport.ec.europa.eu/transport-modes/rail/railway-packages/second-railway-package-2004_en.

created **Common Safety Targets (CSTs)** and independent accident investigation units, and required the creation of individual **National Safety Authorities (NSAs)** to supervise railway safety for each respective member state.[40] This package also brought in Directive 881/2004/EC, which called for the creation of a Railway Agency to supervise the implementation of railway directives, while also giving European states a forum to discuss and negotiate future directives. This directive, alongside the entirety of the Second Railway Package, was the origin of the European Railway Agency. These are important steps towards the EU's goal of a complete **Common Transport Policy**, yet, from integrating EU's expanding common market area to addressing gaps in railway legislation, there are still other challenges that the EU and the ERA will have to confront in the future.[41]

Possible Solutions

Figure 6. A Deutsche Bahn high speed train in a German train station[42]

To understand what the ERA can do to boost European integration, one must look at two factors: (1) where current EU legislation lacks and (2) the areas where recent European railway reports (independent or bloc-sponsored) state that reform is still needed. From this perspective, it becomes clear that there are various grounds that the Agency is expected to address, and therein exist possible ways to address such issues in a manner that makes the European continent more integrated.

Encouraging Industry Competition

For instance, one of the key criticisms of the first two railway packages is that it has not opened up passenger railway transport to international competition. Thus, the main national passenger railway providers have remained entrenched in

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[40] Holvad, Torben. "Review of Railway Policy Reforms in Europe." *Built Environment (1978-)*, vol. 35, no. 1, 2009, pp. 24–42. JSTOR, http://www.jstor.org/stable/23289642

[41] Pernice, Davide. "Common Transport Policy: Overview." *Fact Sheets on the European Union*, Apr. 2023, europarl.europa.eu/factsheets/en/sheet/123/common-transport-policy-overview.

[42] Photograph. Pxfuel. https://www.pxfuel.com/en/free-photo-ogzov.

their respective nations, even if it affects the quality or quantity of options that customers have. The first railway package opened up the continental networks for freight transport, which has led to said railway transport type growing at a faster pace than passenger transport.[43] Opening this latter market would help them catch up not just to their freight counterparts, but also to increase competitiveness compared to Europe's other mediums of transportation–a common goal for both freight and passenger railway transportation providers.

Opening up the market is even more important considering the expansion of the **Schengen Area**. This bloc within the EU guarantees free passage to and from any country within the area without need for passport or customs, which has been a boon for European interconnectedness.[44] It is widely expected that the Schengen Area will expand into Eastern European EU members by the end of 2007, and European railways ought to keep up with this expansion. If railway competition access cannot keep up with the continental easing of customs, railways will not be competitive compared to other modes of

transport that have adapted to the new polices, nor will it make trains an enticing or accessible option for customers throughout the continent.

Codifying Rights And Obligations

Another topic that must be addressed to improve the European providers is specifying the duties of entities participating in the railway industry across the board. From passengers, drivers, and local operators and maintenance, EU countries as of 2006 currently have different–and sometimes conflicting–codes regarding the rights and obligations of the different groups of individuals involved in the European railway business.[45] This partially derives from the two aforementioned train schedule systems that are present in Europe (high density and decentralized high speed), which has led to different interests in national train networks. In turn, companies and individuals may have different expectations when dealing with railways in different countries. And should it be excessively complicated, it may discourage business, transport and international movement. For example, Southern European countries like Austria emphasize accessibility of local businesses to major markets, while Central European countries like Germany emphasize the goal of creating a Single European Railway

[43] Holvad, Torben. "Review of Railway Policy Reforms in Europe." *Built Environment (1978-)*, vol. 35, no. 1, 2009, pp. 24–42. JSTOR, http://www.jstor.org/stable/23289642.

[44] Gelatt, Julia. "Schengen and the Free Movement of People across Europe." *Migration Policy Institute*, 1 Oct. 2005, migrationpolicy.org/article/schengen-and-free-movement-people-across-europe.

[45] Holvad, Torben. "Review of Railway Policy Reforms in Europe." *Built Environment (1978-)*, vol. 35, no. 1, 2009, pp. 24–42. JSTOR, http://www.jstor.org/stable/23289642.

Area.[46] These expectations may contradict each other, such as if a freight train company must define its bulk transport price policies–should it have identical rates for all countries, or should rates be different based on the specific countries its trains are traveling through? These scenarios may create friction between EU member states, and make it important to streamline national and regional interests across the continent.

Diversifying Consumer Outreach Strategies

Finally, the ERA must also organize a competitiveness strategy to combat its lessening share of passenger and cargo volume and gain new customers for European railway services. Reforms can only go so far if there is no customer and income base to balance the reforms' expenses. Though it is up to ERA to define its new strategy, there are multiple grounds that it can be based on. For example, it's important to improve the railway's advertisement method–a field where trains have lagged behind other transportation

mediums.[47] Emphasizing growing telecommunications fields, such as the internet, may create an edge for trains over other transportation methods. Additionally, connecting proposed reforms, such as solidifying a unified ticketing system and lowering bureaucratic red tape for international travel, may attract new customers with practical offers few other transportation systems can match.[48] This would also take advantage of European railway's emphasis on interconnecting the continent, as ultimately, European railway expansion has to go together with increasing EU interconnectedness.

[46] "Austrian Railway Policy." *Federal Ministry Republic of Austria - Climate Action, Environment, Energy, Mobility, Innovation and Technology*, bmk.gv.at/en/topics/transport/railways/austria.html; "European Rail Transport Policy." Federal Ministry for Digital and Transport, 9 Mar. 2021, bmdv.bund.de/EN/Topics/EU-Policy/EU-Transport-Policy/European-Rail-Transport-Policy/european-rail-transport-policy.html.

[47] Tunnicliffe, Andrew. "Timeline: Europe's Dream for a Single Railway, Two Decades In." *Railway Technology*, 14 Aug. 2019, railway-technology.com/features/rail-transport-in-europe/; "European Union Agency for Railways (ERA)." Railway-News, railway-news.com/associations/european-union-agency-for-railways-era/.

[48] Saralegui, María Elorza, and Helena Rodríguez. "Why Is Train Travel so Unpopular in Europe?" *euronews*, 20 Apr. 2022, euronews.com/green/2022/04/15/european-train-travel-isn-t-as-popular-as-it-should-be-here-s-why.
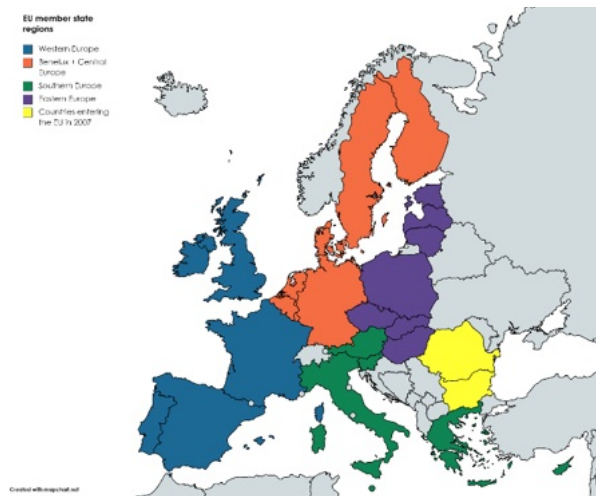
Bloc Positions

Figure 7. The various selected regions of EU countries as of 2005 (blue, green, purple and orange), and countries entering the EU in 2007 (yellow).[49]

Provided the European Union's continental size, it is not surprising that the organization can be geographically divided into different regions. The selected regions are divided into countries that share a similar geographical, historical and railroad contexts, while having similar outlooks on future European railroad policy. Delegates may look at representatives from their own region as ones that have similar goals, and therefore, possible partners. However, it's important to note that these regions should not limit the possible countries any delegate aspires to work with. More than anything, this list is here to present background positions information in an organized fashion. The dais looks favorably upon multi-regional blocs in committee, as working solutions will only come from dialogue and programs that address continental needs as a whole.

Western Europe

Western Europe has been historically one of the key proponents of railroad innovation, and the European Railway Agency should be no exception for this. Given the flat and rich nature of these countries, they are proponents of implementation of a High Speed Rail Network, while remaining conscious of the need to aid regional railroad development for other regions, so as to ensure European railroad integration advanced as a group.

At the same time, it is worth noting that France and the United Kingdom may look to retain special autonomies, partially due to their national ethos. This is already seen in France's unique ticketing system, and the United Kingdom's reluctance to start using the Euro currency on the basis of Chancellor of the Exchequer Gordon Brown's "five tests" on the benefits of the United Kingdom replacing the pound with the euro.[50] As such, in negotiating European railroad integration, we can expect these countries to be enthusiastic to advance this cause, while

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[49] Generated by author using MapChart. *https://www.mapchart.net/europe.html*.

[50] Segal, Troy. "Why the U.K. Doesn't Use the Euro." *Investopedia*, 3 July 2023, investopedia.com/ask/answers/100314/why-doesnt-england-use-euro.asp.

remaining guarded to protect certain autonomies they retain.

Benelux, Scandinavia, And Central Europe

Though Benelux (Belgium, the Netherlands, and Luxembourg) and Central Europe have a very similar historical background to Western Europe, differences in its human geography requires contextualization for railways. Particularly, it presents important nuances towards the unconditional implementation of a universal High Speed Train Network. The high population density of the Benelux countries makes them favor a larger, yet slower fleet for urban areas.

Meanwhile, the extremely low population of Sweden and Finland's northern areas, which do not even have a cross-border railway, makes it impractical to have a high maintenance network such as the High Speed Rail to be placed in most areas of both countries.[51] However, a possible answer to this dilemma could come from Germany and its efficient rail network, which combines large scale coverage of high speed rail and efficient urban networks in populated areas, albeit only achieved through the nation's economic strength and history of large scale investment into transportation infrastructure. Germany also seeks to export this model to

foment the creation of a Single European Railway Area.[52] Whatever answer the region wants to offer the continent, what is sure is that it highlights the complexities of integrating the railroad network in a continent wide area, and the different ideas and resources that come with it.

Southern Europe

Southern Europe is primarily encompassed by Mediterranean-facing countries. These countries look favorably upon integration through improved railroad transportation, and mechanisms to ensure improved efficiency on the proposed reforms. In particular, integration would help export their businesses to the rest of the continent and make Southern Europe a competitive economy in comparison to Western and Central European states like France and Germany.[53] However, a common challenge they face is geographic isolation from the rest of the European Union due to their geography, such as mountainous, peninsula, and island locations. For Southern European states to achieve their goals, they must address existing geographical barriers while enticing other countries to

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[51] Smith, Ian. "Finland to Sweden Train Route Could Open by 2025." *Euronews*, 13 Apr. 2023, euronews.com/travel/2021/04/12/passenger-trains-between-finland-and-sweden-moves-a-step-closer.

[52] "European Rail Transport Policy." Federal Ministry for Digital and Transport, 9 Mar. 2021, bmdv.bund.de/EN/Topics/EU-Policy/EU-Transport-Policy/European-Rail-Transport-Policy/european-rail-transport-policy.html.

[53] "Austrian Railway Policy." *Federal Ministry Republic of Austria - Climate Action, Environment, Energy, Mobility, Innovation and Technology*, bmk.gv.at/en/topics/transport/railways/austria.html.

participate in their proposals through cooperative stances.

Figure 8. Current map of the European High Speed Rail Network[54]

Eastern Europe

Eastern European countries are perhaps the countries that face the most challenges towards EU railroad integration. Of course, this comes to the surprise of few, as it has been less than two decades since these countries abandoned their previous communist governments, giving them a mountain to climb in terms of catching up with their new western partners. As such, these countries would look favorably upon programs to encourage the cooperative modernization of continental railroads, such as the Trans-European

Railway Project.[55] Finally, these countries are also looking to ensure that the new EU-mandated national railroad agencies (such as independent organizational entities and national safety authorities) can be structured in a way that doesn't destabilize the volatile regional transportation sector in its newly introduced competitive market dynamics.[56]

Countries Soon To Enter The European Union

Romania and Bulgaria both signed the EU accession protocol in early 2005, and are expected to join the European Union by the beginning of 2007. Both countries have similar geographical and historical contexts as Eastern European member states; therefore, if the committee is to consider them in current policy making, the two Balkan states can be assumed to have similar wants and needs to Eastern Europe.

However, a unique circumstance the two nations bring (which gives the committee plenty to think about), is their accession protocols being delayed various years due to national corruption and

[54] BIL, High_Speed_Railroad_Map_Europe_2009 gif: Bernese mediaderivative work: High Speed Railroad Network in Europe in 2011. December 12, 2010.
High_Speed_Railroad_Map_Europe_2009.gif.
https://commons.wikimedia.org/wiki/File:High_S peed_Railroad_Map_Europe_2011.png.

[55] "Trans-European Railway (TER) Project : Report on Activities Implemented in the First Half of 2004." *United Nations*, 9 Aug. 2004, https://digitallibrary.un.org/record/527680?ln=en.

[56] Tánczos, Katalin, and György Bessenyei. "East European Rail: The State of the Network." *Built Environment (1978-)*, vol. 35, no. 1, 2009, pp. 136–48. JSTOR, http://www.jstor.org/stable/23289649.

crime issues.[57] This brings to question what measures can ERA take in order to ensure that corruption is kept away from European railways. Finally, any new policies the ERA enacts will have to work for both existing and incoming EU members in a sustainable and efficient manner; therefore, these two countries are great to test whether such possible new policies would function for future EU countries.

[57] Mcgrath, Stephen. "Bulgaria, Romania See Benefits and Snags since Joining EU." *AP News*, 5 Jan. 2022, apnews.com/article/coronavirus-pandemic-health-business-romania-europe-f7afd35bd308ced4a549f12439f771eb.

Glossary

Common Safety Targets (CSTs): Bloc-wide railway security goals established through the Second Railway Package.

Common Transport Policy: Organized liberalization of transportation markets, procedures, and social provisions as planned by the European Union.

European Coal and Steel Community: First European common market organization, established for coal and steel products in 1951. Merged with the European Economic Community in 1967.

European Commission: One of the two executive law-making arms of the European Union (alongside the European Council). This executive power is used primarily through directives.

European Common Market Area: The proposed integration of European economic policy to guarantee free movement of goods, services, capital and people.

European Economic Community: The regional organization established in 1957 to promote the economic integration of Europe. Slowly merged into the European union from 1993 to 2009.

European Goods Train Timetable (EKG) Conference: Major conference hosted from 1872 up to the present dedicated to coordinate European train record keeping and scheduling.

European Union: The modern European international organization dedicated to the political and economic integration of the European continent.

Freight Transport/Freight: Formal term for train cargo transportation.

"Grade Separated and Electrified" Rails: Specially designed rails needed to sustain the strenuous requirements of high speed train operations.

High Speed Rail Network: The various separate rail segments and organizations that operate high speed trains (trains that go at least 200 kilometers per hour). This is not necessarily a continuous network.

Independent Organizational Entities: National units established by the first railway package that supervise the management and operation of the railway systems in EU member states, so as to ensure efficiency and impartiality.

Interoperability: In the context of European railways, ensuring that all relevant factors within the same system operate and are held under the same standards throughout the Area.

National Safety Authorities (NSA): National organizations mandated by the Second Railway Package to supervise the railroad security situation in respective EU countries.

Railway Package: The two coordinate bundles of railway directives approved by the European Commission in 2001 and 2004. The European Railway Agency hails from the second package.

Rights to Network Access: Policy that demarks who and what are allowed to operate in the railway under the given authority's jurisdiction, what duties they must uphold to retain this, and what tenants must aspiring operators meet to be given access.

Schengen Area: Bloc within the EU and its Common Market Area that guarantees the passage of people through national borders without a need for passport or customs.

Single European Railway Area: The policy goal of unifying EU train operations into a singular continental standard.

Through Coaches: Train carts designed to be reconfigured from one train to another when the passengers in the cart have a different destination than the original train.

Ticketing System: Portal used by a train provider to both sell tickets and provide information to customers. A unified ticketing system would be used by various providers rather than just one.

Trans-European Railway (TER) project: Project backed by the United Nations's Economic and Security Council to upgrade the railway equipment in Eastern and Central Europe (including the Balkans) so it meets Western European standards.

Treaty of Rome: 1957 Treaty that created the European Economic Community. Its Title IV established the first major effort to unify European transportation policy.

Bibliography

Alex. "European Rail Maps." *Vivid Maps*, 30 Sept. 2020, vividmaps.com/european-rail-maps/.

"Austrian Railway Policy." *Federal Ministry Republic of Austria - Climate Action, Environment, Energy, Mobility, Innovation and Technology*, bmk.gv.at/en/topics/transport/railways/austria.html.

Cerny, Philipp. "Rail: The Challenges of a Single European Railway Area." *Heinrich-Böll-Stiftung*, 3 Feb. 2021, eu.boell.org/en/rail-the-challenges-of-a-single-european-railway-area.

Cha, Sung Jik. "Railroads in 19th Century Europe : Great Britain, France, Germany, and Russia." *WHKMLA*, May 2008, www.zum.de/whkmla/sp/0910/csj/csj1.html.

Danny. "Ticket Distribution: The Failure of Railways to Sell Themselves." *Trip By Trip*, 17 Mar. 2018, tripbytrip.org/2018/03/17/ticket-distribution-the-failure-of-railways-to-sell-themselves/.

De Munter, André. "The Enlargement of the Union." *Fact Sheets on the European Union*, Apr. 2023, www.europarl.europa.eu/factsheets/en/sheet/167/the-enlargement-of-the-union.

"DIRECTIVE 2001/16/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL." *EUR-Lex.Europa.Eu*, 19 Mar. 2001, eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX%3A32001L0016%3AEN%3AHTML.

"ERA's Vision, Mission, Values and Tasks." *European Union Agency for Railways*, 3 Feb. 2023, www.era.europa.eu/agency-you/agency/vision-mission-values-tasks.

"European Rail Transport Policy." *Federal Ministry for Digital and Transport*, 9 Mar. 2021, bmdv.bund.de/EN/Topics/EU-Policy/EU-Transport-Policy/European-Rail-Transport-Policy/european-rail-transport-policy.html.

"European Union Agency for Railways (ERA)." *Railway-News*, railway-news.com/associations/european-union-agency-for-railways-era/.

"First Railway Package of 2001." *European Commission - Mobility and Transport*, transport.ec.europa.eu/transport-modes/rail/railway-packages/first-railway-package-2001_en.

"Freight Transportation: The European Market." *Office of International Programs - U.S Department of Transportation*, June 2002, international.fhwa.dot.gov/eurofreight.cfm.

"FTE History." *Forum Train Europe FTE*, forumtraineurope.eu/organisation/forum-train-europe/history/.

Gelatt, Julia. "Schengen and the Free Movement of People across Europe." *Migration Policy Institute*, 1 Oct. 2005, migrationpolicy.org/article/schengen-and-free-movement-people-across-europe.

Holvad, Torben. "Review of Railway Policy Reforms in Europe." *Built Environment (1978-)*, vol. 35, no. 1, 2009, pp. 24–42. JSTOR, http://www.jstor.org/stable/23289642.

HSR 101. "What Is Needed to Go Fast?" *High Speed Rail Alliance*, 25 Jan. 2023,
hsrail.org/blog/what-is-needed-to-go-fast/.

"International Tourism by Mode for Selected Countries, 1995." *European Environment Agency*, 12 Nov.
2009,
eea.europa.eu/data-and-maps/figures/international-tourism-by-mode-for-selected-countries-1995.

Macchi, Marco, et al. "Maintenance management of railway infrastructures based on reliability analysis."
Reliability Engineering & System Safety, vol. 104, 2012, pp. 71-83, ISSN 0951-8320,
https://www.sciencedirect.com/science/article/pii/S0951832012000518.

Mathieu, Gilbert. "'The History of the ECSC: Good Times and Bad' from Le Monde (9 May 1970)."
CVCE.EU by Université Du Luxembourg, 5 July 2016,
www.cvce.eu/obj/the_history_of_the_ecsc_good_times_and_bad_from_le_monde_9_may_1970-
en-54f09b32-1b0c-4060-afb3-5e475dcafda8.html.

Mcgrath, Stephen. "Bulgaria, Romania See Benefits and Snags since Joining EU." *AP News*, 5 Jan. 2022,
apnews.com/article/coronavirus-pandemic-health-business-romania-europe-f7afd35bd308ced4a54
9f12439f771eb.

"Motorised Transport: Train, Plane, Road or Boat - Which Is Greenest?" *European Environment Agency*, 24
Mar. 2021, eea.europa.eu/highlights/motorised-transport-train-plane-road.

Pernice, Davide. "Common Transport Policy: Overview." *Fact Sheets on the European Union*, Apr. 2023,
europarl.europa.eu/factsheets/en/sheet/123/common-transport-policy-overview.

Pike, John. "Mussolini: The Trains Ran on Time." *GlobalSecurity.Org*, 15 Nov. 2011,
www.globalsecurity.org/military/world/europe/it-trains-ran-on-time.htm.

"REGULATION (EC) No 881/2004 OF THE EUROPEAN PARLIAMENT AND OF THE
COUNCIL of 29 April 2004 Establishing a European Railway Agency (Agency Regulation)."
EUR-Lex, 29 Apr. 2023, eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32004R0881.

Saralegui, María Elorza, and Helena Rodríguez. "Why Is Train Travel so Unpopular in Europe?" *euronews*,
20 Apr. 2022,
euronews.com/green/2022/04/15/european-train-travel-isn-t-as-popular-as-it-should-be-here-s-wh
y.

"Second Railway Package of 2004." *European Commission - Mobility and Transport*,
https://transport.ec.europa.eu/transport-modes/rail/railway-packages/second-railway-package-200
4_en.

Segal, Troy. "Why the U.K. Doesn't Use the Euro." *Investopedia*, 3 July 2023,
investopedia.com/ask/answers/100314/why-doesnt-england-use-euro.asp.

Smith, Ian. "Finland to Sweden Train Route Could Open by 2025." *Euronews*, 13 Apr. 2023,
euronews.com/travel/2021/04/12/passenger-trains-between-finland-and-sweden-moves-a-step-clos
er.

Tánczos, Katalin, and György Bessenyei. "East European Rail: The State of the Network." *Built
Environment (1978-)*, vol. 35, no. 1, 2009, pp. 136–48. JSTOR,
http://www.jstor.org/stable/23289649.

The World Bank. "Railway Reform in the Western Balkans." *European Commission, Mobility and
Transport*, Dec. 2005, pp. 9-12,
transport.ec.europa.eu/system/files/2016-09/2005_world_bank_western_balkans_railways_report.
pdf.

"Train, Ice, Travel, German, Transport, Railway, Mode of Transportation, Public Transportation,
Transportation, Rail Transportation." *Pxfuel*, www.pxfuel.com/en/free-photo-ogzov. Accessed 14
July 2023.

"Trans-European Railway (TER) Project : Report on Activities Implemented in the First Half of 2004."
United Nations, 9 Aug. 2004, https://digitallibrary.un.org/record/527680?ln=en.

"TRAITÉ Instituant La Communauté Économique Européenne et Documents Annexes."
EUR-Lex.Europa.Eu, 25 Mar. 1957,
eur-lex.europa.eu/legal-content/FR/TXT/PDF/?uri=CELEX:11957E/TXT.

"Transport Safety Performance in the EU – A Statistical Overview." *European Transport Safety Council*, 1
July 2003, etsc.eu/transport-safety-performance-in-the-eu-a-statistical-overview/.

Tunnicliffe, Andrew. "Timeline: Europe's Dream for a Single Railway, Two Decades In." *Railway
Technology*, 14 Aug. 2019, railway-technology.com/features/rail-transport-in-europe/.

Statement Of The Problem

One Continent, Many Standards

The origins of railways in the European Union date back to the Industrial Revolution and the 19th century. While the first lines built in the era were privately owned and of low quality, they were improved as the 19th century progressed. In different countries, this improvement took different and often incompatible forms. At first, these differences never posed an issue, though as the complexity and size of networks using different standards grew, major issues started to bubble up.

Take, for example, the variety of electrification voltages that dot the continent: Northern France uses 25 kV AC power while the Netherlands, just a couple hundred miles away, uses 1.5 kV DC power.
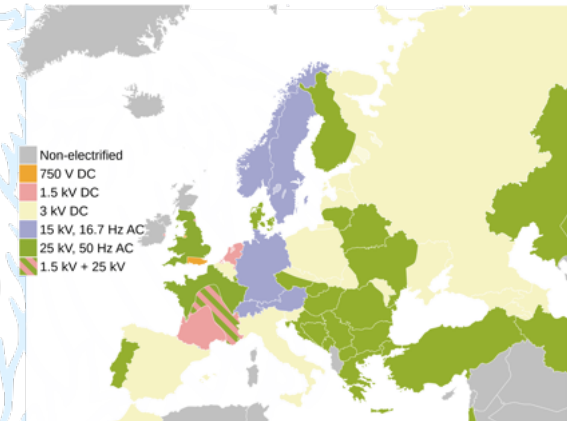

Figure 9. Map of Railway Electrification Voltage by Country[58]

These different standards are just that–different–with neither being markedly better than the other. Differences in standards will be hard to resolve since national rail providers have little incentive to spend hundreds of millions of euros to match their network to a Europe-wide standard without top-down direction. However, electrification in particular has one thing going for its standardization: much of Europe's rail network isn't electrified.[59] The expansion of

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[58] Wikimedia Commons contributors, "Europe rail electrification map," Wikimedia Commons, last modified September 6, 2022, accessed August 27, 2023, https://commons.wikimedia.org/wiki/File:Europe_rail_electrification_en.svg.

[59] Statista, "Share of the rail network which is electrified in Europe," Statista, last modified August 23, 2020, accessed August 27, 2023, https://www.statista.com/statistics/451522/share-of-the-rail-network-which-is-electrified-in-europe/#:~:text=Out%20of%20the%20European%20Union,at%2056.6%20percent%20in%202020.

electrification to improve European railways as a whole presents a great opportunity for standardization. This kind of discrepancy is the exact sort that the ERA is meant to deal with through its power to set standards for the entire EU.

However, other discrepancies don't present easy solutions. For example, much of Spain and Portugal's networks use Iberian gauge, where the train tracks are slightly wider than the standard 4' 8.5" inches used in much of the world. With this system, there is no opportunity to use expansion as a means of mandating standardization. Furthermore, the entire standard Iberian network uses the Iberian gauge, meaning that changing this on some lines poses other problems for intra-network connectivity. However, Iberia does have one thing making standardization easier: the European standard calls for a narrower track gauge than the one currently in use. The extent to which outlier systems like those of Spain and Portugal will have to harmonize their systems with everyone else will be a key question that will have to take a wide variety of costs and benefits into account.

Other systems are less permanent and are completely reinvented within the passing of a single generation, such as signaling systems. The point of a signaling system is to ensure that trains don't collide by communicating that a section of track is occupied. There are many ways to achieve this goal, especially in the age of wireless communication, and thus it will be crucial to continue to develop and implement such a system–a process that began with the trans-European conventional rail directive of 2001.

Some issues with European railways come not from how different systems interact, but the systems themselves. Specifically, two issues exemplify this class of issues: repairing and upgrading low-quality lines on the margins of the network and expanding Europe's fledgling high-speed rail (HSR) network. The former issue is important because of the recent accession to the EU of former Eastern bloc countries including Poland, Hungary, and Czechia.[60] As former Eastern bloc members, these countries have long been far poorer than longtime EU members such as Germany and France–Poland's GDP per capita was just 44% of Germany's in 2006, though the gap had been twice as large a mere 15 years prior.[61] Therefore, the rail infrastructure in these former Eastern bloc countries lags far behind that of Western Europe.

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[60] BBC News, "Who are the "A8 countries" BBC News, April 18, 2005, accessed August 27, 2023, http://news.bbc.co.uk/2/hi/programmes/panorama/4479759.stm.

[61] Our World in Data, "GDP per capita (current US$) - World Bank," Our World in Data, accessed August 27, 2023, https://ourworldindata.org/grapher/gdp-per-capita-worldbank?tab=chart&country=DEU~POL~HUN~CZE~SVK~SVN~EST~LTU~LVA.

At the same time, rail ridership is rising across Western Europe as a result of the recent spate of high-speed rail expansions. France opened its LGV Méditerranée in 2001, and the opening of the Lille-Brussels line is slated for the very near future. Spain and Italy have similarly bright HSR futures: Spain's is opening their Madrid-Barcelona line next year and Italy's Milan to Bologna line will soon follow.[62, 63]

However, the EU has even grander plans: in their 1996 directive calling for an integrated European high-speed rail network, the European commission identified seven axes for high-speed rail development.[64] These corridors cover much of Europe and go far beyond what currently exists. Delegates will have to figure out how to

[62] La Vanguardia, "El AVE llega a Tarragona y Lleida desde Madrid y Barcelona," La Vanguardia, December 18, 2006, accessed August 27, 2023, https://web.archive.org/web/20071128032630/http://www.lavanguardia.es/gen/20061218/51297191921/noticias/el-ave-llega-a-tarragona-lleida-madrid-barcelona-jose-montilla-generalitat-fomento-campo-magdalena-alvarez-joaquim-nadal-joan-rangel-joan-clos-girona.html.

[63] Ferrovie dello Stato Italiane, "Milan-Bologna line: ten years of high-speed," Ferrovie dello Stato Italiane, December 13, 2018, accessed August 27, 2023, https://www.fsitaliane.it/content/fsitaliane/en/media/press-releases/2018/12/13/milan-bologna-line--ten-years-of-high-speed.html.

[64] European Union, "Council Directive 96/48/EC of 23 July 1996 on the interoperability of the trans-European high-speed rail system," EUR-Lex - Access to European Union Law, July 23, 1996, accessed August 27, 2023, https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31996L0048:EN:HTML.

distribute and prioritize funding for these crucial projects.

Finally, there is the issue of Europe's fledgling system of private operators. While the United Kingdom has already fully embraced separation of rail infrastructure from operations, other countries have been a bit slower to follow. Therefore, it is crucial to lay down the guidelines for private operations that ensure a) equal access to operate on railway infrastructure; b) services that share lines don't conflict; c) lines open for private operations are decided upon; d) the infrastructure owners (existing national railways) maintain and improve their financial positions; and e) room is provided for innovation. Figuring out the solutions to all of these issues will be a difficult task, but a crucial one for the future of Europe's railways.

History Of The Problem

Diverging Approaches To Systems

Railways as we know them were pioneered in Britain at the start of the 19th century. At first, the lines were short and frequently relied on horse power. It was not until 1830 that the worlds' first intercity line opened, linking Manchester to Liverpool. This line was notable for not allowing anything but steam power upon its opening and for its use of primitive signaling, which consisted of people regularly stationed on the line holding flags. With continued industrialization and the

accompanying technological advancement, telegraph-based signaling started to replace flaggers in the 1840s.[65] As signaling systems became more advanced, they required more on-train equipment, meaning that it became more difficult to have trains operate between systems. This lack of coordination wasn't much of an issue in an era when 30 miles per hour was considered high speed and international travel was uneconomical and uncommon.

As railways grew so did their technological complexities. Take for example the Liverpool-Manchester line, where whether a train would fit depended on the train fitting the loading and track gauges of the line, and nothing else. However, with innovation in systems like signaling and electrification, operating a train on a line meant that all of these increasingly complex systems had to be harmonized.

Nationalization

While Europe's railways were of varying origins, by the end of World War II, most had converged on nationalized systems. While this was great for domestic standardization, this made the prospect of international standardization much more daunting. A good example of this is Sweden's

Automatic Train Control system.[66] The system was first introduced in the late 1970s, and operated without any changes until 1993, by which time there were rumblings of a Europe-wide signaling system. While this is certainly a sign of its high quality, it was also different from systems used elsewhere in Europe. Even if signaling is not the hardest system to replace, it goes to show that nationalization meant that this system was used nationwide and therefore the whole Swedish signaling system–which was working relatively well at the time–would have to be replaced when it came time for a new signaling system.

Furthermore, nationalization fundamentally changed the incentive structure surrounding international operation. While technological and political constraints meant that investment was almost always domestic for the private railways of the 19th century, the question of where to invest was one of profit maximization. Furthermore, these private railroads existed in an environment where they were far and away the best means of transport. This led to rampant speculation, most famously with the UK's railway mania of the

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[65] Science Museum Group, "Standardising Time: From Railways to the Electric Telegraph," Science Museum, accessed August 27, 2023, https://www.sciencemuseum.org.uk/objects-and-stories/standardising-time-railways-and-electric-telegraph#what-was-the-effect-of-the-telegraph-on-the-railways.

[66] Belisa International AB, "Twenty Years of Safe Train Control in Sweden," by Harold W. Lawson, Sivert Wallin, Berit Bryntse, and Bertil Friman, Belisa, accessed August 27, 2023, https://web.archive.org/web/20170808154724/http://belisa.se/taag/artiklar/lawson/lawson.html.

1840s.[67] However, this density of infrastructure was too much for even the 1840s, much less the 20th century with its automobiles. This led to the so-called "Beeching Axe" of the early 1960s, which closed over 10% of railway track miles in the UK.[68] Similar cuts happened almost everywhere in the world with a sizable rail network.[69] While the national systems did cut a lot of route-miles, it had an additional political aim of serving an entire country. Margret Thatcher–a notable privatizer across a wide variety of sectors–once told her transport minister that "railway privatization will be the Waterloo of this government."[70] In short, public operations demanded service to all corners of a country and investment on domestic-focused corridors.

This extended to Europe's forays into high speed rail. For example, France–home to Europe's largest system–built the LGV Sud-Est, which links Paris with Lyon–France's 3rd largest city–and shortens trips to Marseille–the 2nd largest–and the LGV Atlantique, which connects Paris to a number of mid-sized cities in the west of the country before the LGV Nord, which links Paris to Brussels, London, and Amsterdam (and Lille–France's 5th-largest city).[71]

Signaling

Of all the systems, signaling has the most obvious solution. Because of the nature of what it does–telling trains where other trains are–it has advanced a great deal in recent years. Therefore, a new system could offer a major improvement over current conditions. While some countries like Sweden (discussed above) and France have long had some form of train protection, those systems are not the latest technology. For example, the Swedish system dates to the early 1990s. There exists a conundrum for wealthier countries: adopt the standardized and advanced technology or maintain a bespoke but functional system from an earlier era.

[67] Oliver Reynolds, "Railway Mania: The Largest Speculative Bubble You Never Heard Of," FocusEconomics Blog, last modified July 30, 2018, accessed August 27, 2023, https://www.focus-economics.com/blog/railway-mania-the-largest-speculative-bubble-you-never-heard-of/.

[68] Network Rail, "Dr Beeching's Axe," Network Rail, accessed August 27, 2023, https://www.networkrail.co.uk/who-we-are/our-history/making-the-connection/dr-beechings-axe/.

[69] Wikipedia, The Free Encyclopedia, "List of countries by rail transport network size," Wikipedia, accessed August 27, 2023, https://en.wikipedia.org/wiki/List_of_countries_by_rail_transport_network_size.

[70] Daniel Bowen, "Thatcher, privatisation, legacy," Daniel Bowen's diary, April 9, 2013, accessed August 27, 2023, https://danielbowen.com/2013/04/09/thatcher-privatisation-legacy/.

[71] University of Barcelona, "European TGV Network (As of 1999)," University of Barcelona, accessed August 27, 2023, http://www.ub.edu/medame/tgvmap.jpg.

Electrification

Railway electrification dates to the turn of the 20th century. Italy's history of electrification shows a typical path for the expansion of the technology. The first electrified lines were suburban in nature, so in Italy happened to be in Lombardy. Next came mountainous lines where electric traction had major operational advantages over the steam power used at the time. A prime example of this is the Genoa-Turin line, electrified in 1922, linking two prosperous cities separated by mountains. At the time, electrification was still in its infancy, and Italy's railways used a wide scope of voltages. By the 1930s, the national railway, FS, settled on 3Kv DC power for future expansions. Electrification between Rome and Milan came in 1941, and further projects focused on increasingly marginal lines. Two other periods are notable in this history. In the 1960s and 70s, Italy re-electrified many of its 3.6Kv AC lines, as the equipment was out of date, the system wasn't used elsewhere, and the system was incompatible with others, as it used a two-wire setup. Finally, Italy's soon-to-open high speed rail network will be electrified at 25Kv AC, which is common on high speed systems across Europe.[72, 73]

Sticking Together

One of the best things about trains is their ability to move as a single large unit. To unlock this ability, trains needed a way to stick multiple cars together. Originally, this was through simple "buffer and chain" couplers, which were designed to prevent carriages from moving too close together and from coming apart. In 1873, American Edwin Janney developed the so-called "knuckle connector", which was much safer than the previous buffer and chain systems.[74] Today, the technology is standard around the world, but not yet in Europe.[75]

Privatization

In 1991, the European commission passed a directive requiring the separation of railway operations from infrastructure, going against the way most railroads have been operated for as long as there have been railroads. In many cases, countries handled this mandate by simply putting the two functions in separate accounts. For example, France separated RFF (infrastructure owner) from SNCF (national train company), though RFF existed mostly on paper as it didn't

[72] Railway Technology. April 16, 2000. "Italy Rail Projects." Accessed August 27, 2023. https://www.railway-technology.com/projects/italy/.

[73] Chitti, Marco. October 11, 2022 "A Brief Visual History of Rail Electrification." Marco Chitti's Substack. Accessed August 27, 2022.

https://marcochitti.substack.com/p/a-brief-visual-history-of-rail-electrification.

[74] Burns, Adam. 2023. "Railroad Couplers in North America." American Rails. Accessed August 27, 2023.
https://www.american-rails.com/couplers.html.

[75] "Buffers and Chain Coupler," Alchetron, September 4, 2022, accessed August 27, 2023, https://alchetron.com/Buffers-and-chain-coupler.

even maintain the infrastructure it owned (this task went to SNCF infrastructure).[76] But other countries did embrace privatization. For example, the UK fully privatized passenger operations, prescribing a great deal of the operational specifications, but allowing private companies to bid on operations. International high-speed routes, however, were largely run by the privately-owned Thalys.

Past Actions

Attempts to harmonize railway operations across Europe are almost as old as Europe's railways themselves. However, they have grown more prevalent with the creation of the European Union and accompanying increases in economic interconnectedness.

The Rise Of The Standard Gauge

The standard gauge is as old as the railway itself. In fact, the Liverpool and Manchester–the world's first intercity railway–was built to a 4' 8" gauge, just half an inch more than the eventual standard.[77] However, at the time, it was not standard in England–or anywhere in the world

for that matter. At the time, various railways thought it wise to optimize the track gauge to their needs. For example, England's Great Western promoted the use of a 7' 0.75" gauge, citing its benefits for high speed operation. However in 1845, Parliament passed an act mandating the use of standard gauge on all new railways. It was chosen for its overwhelming adoption even at the time. This sort of approach will be needed to standardize remaining systems. In cases where the most railways already use one system, bringing the others over to that system will be wise.

High-Speed Rail: A Blank Slate As A Time To Get It Right

The first high speed rail line in Europe was Italy's *Diretissimo* (meaning most direct) line between Florence and Bologna. Opened in 1934, this line was essentially just a cutoff that was built because of the steep grades and sharp curves that the previous line had taken through the Tuscan mountains over one of the most important connections in Italy. However, it did cut an hour and a half off the Florence-Bologna journey.[78]

Building the line was a complicated endeavor as it took 21 years to complete its construction.[79]

[76] "SNCF Réseau: Presentation Briefly," Internet Archive, July 4, 2017, accessed August 27, 2023, https://web.archive.org/web/20170704182225/http://www.sncf-reseau.fr/en/about/presentation/briefly.

[77] "A History of Track Gauge." *Trains Magazine*, May 1, 2006. Accessed August 27, 2023, https://www.trains.com/trn/railroads/history/a-history-of-track-gauge/.

[78] "The Apennine Tunnel." *Nature*, April 28, 1934. Accessed August 27, 2023, https://www.nature.com/articles/133644g0.

[79] "Bologna-Florence Railway." *Structurae*, accessed August 27, 2023, https://structurae.net/en/structures/bologna-florence-railway.

While World War I certainly lengthened this construction timeline, it was a massive expenditure that would be hard to justify without great benefit, because of which another high speed rail wouldn't be built for another 40 years. Italy opened a Florence-Rome line in 1977 and France opened its first TGV (train à grande vitesse or high-speed train) line between Paris and Lyon in 1981.[80] While these lines were certainly impressive feats of engineering, their primary purpose was to link domestic destinations.

The first official action that signaled that high speed rail could be more than a domestic affair was Spain's choice to build its high speed network for standard gauge trains (the country's conventional network had always used 1668 mm Iberian gauge). Spanish planners settled on standard gauge in the hope that their network would eventually work alongside France's network and the broader European high-speed rail network.[81]

However, the biggest move towards international high-speed rail came with the opening of the Channel Tunnel in 1994.[82] The line was built jointly by the British and French governments, and they created a joint company, along with Belgium known as Eurostar to operate the line.[83] But the line had its issues surrounding compatibility. On its first trip, a circuit breaker designed to deal with the different electrification standards used in the UK and France malfunctioned.[84] There were also more systemic problems, which meant that as of the timing of this committee (2006), there is still no DB service between London and Germany.

Because of these difficulties and the great potential of cross-border high-speed rail, the European Council defined the Trans-European High Speed Rail Network as one of its essential transport networks. However, the real impact of this directive was more in its technical standards for interoperability (TSIs) than its rail network. EU Directive 96/48 says that its goal is to "achieve interoperability within Community

[80] "The Country of High Speed Rail Innovation | Italy High Speed Rail." *RM Transit*, April 15, 2023. Accessed August 27, 2023. https://www.youtube.com/watch?v=-FEBMWSpIVE.

[81] Ben Jones. "Spain's high-speed railway revolution." *CNN*, September 7, 2021. Accessed August 27, 2023. https://www.cnn.com/travel/article/spain-high-speed-rail-network/index.html.

[82] Encyclopædia Britannica, "Channel Tunnel," Encyclopædia Britannica, August 18, 2023, accessed August 27, 2023, https://www.britannica.com/topic/Channel-Tunnel.

[83] Eurostar, "About Us," Eurostar, accessed August 27, 2023, https://www.eurostar.com/us-en/about-eurostar/company-ownership.

[84] Christian Wolmar, "Channel train opens with a breakdown," The Independent, October 20, 1994, accessed August 27, 2023, https://web.archive.org/web/20210109230236/https://www.independent.co.uk/news/uk/channel-train-opens-with-a-breakdown-1444085.html.

territory of the trans-European high-speed rail system."[85] High speed rail was the perfect starting point for standardized European rail for a number of reasons. The network simply wasn't that big relative to the conventional network. Related to that is the fact that the network is not fully built out yet, and the EU will likely play a role in financing future lines–major pieces of infrastructure and can therefore attach standardization-related conditions to this funding. Finally, the technology is perfect for passenger journeys over distances of 200-500 miles, and many of those journeys cross international borders.

Possible Solutions

With this history in mind, it is worth looking at some specific systems and things that have been done and can be done to bring different systems closer to the ERA's mission of seamless trans-European travel.

Signaling

One of these TSIs was signaling. The specific standard was known as the European Railway Traffic Management System (ERTMS). After the 1996 high-speed rail standardization directive, the

final details of the system were delegated to the Union of the Signaling Industry (UNISIG), which included the likes of Alstom, Ansaldo Signal, Bombardier, Invensys Rail, Siemens and Thales.[86] However, ERTMS rollout has been slow, with much of the trackage actually being on non-European high-speed lines. One reason for this slow rollout is that there are other systems that can do the same things that ETCS (European Train Control System) can do.[87] However, part of the benefit of ETCS comes from its ability to do train-to-train communications. Therefore, wide adoption is key to its success.

Electrification

As detailed in the "History of the Problem," rail electrification in Europe dates to the turn of the 20th century, and has converged on a couple of standards. However, Europe's rail electrification is far from complete. With expanding electrification emerges two needs. First of all,

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[85] "Council Directive 96/48/EC of 23 July 1996 on the interoperability of the trans-European high-speed rail system," EUR-Lex - Access to European Union Law, July 23, 1996, accessed August 27, 2023, https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31996L0048:EN:HTML.

[86] Kaiser, Warren and Stein Nielson (14 March 2008). "The Core of ATP – Data Engineering". IRSE Technical Meeting "All About ATP" Sydney. Archived from the original on 29 April 2013. Retrieved August 27, 2023. https://web.archive.org/web/20130429142912/http://irse.org.au/index.php/en/component/docman/doc_download/54-the-core-of-atp-data-engineering?Itemid=71.

[87] David Briginshaw, "Will digitalisation spur ETCS deployment in Europe?," International Railway Journal, May 1, 2018, accessed August 27, 2023, https://www.railjournal.com/opinion/will-digitalisation-spur-etcs-deployment-in-europe/.

some degree of standardization is necessary for a truly integrated trans-European system. While one standard across the whole continent would be ideal, convergence on 2-3 standards will still mean that vendors will not want to cede the market everywhere that uses a particular standard and coordination between standards will not become a matching game. Second, expansion is a prime opportunity for standardization, a fact that we can see everywhere from Italy settling on 3Kv DC power in the 1920s to today's upcoming high speed lines. This is especially important because of how much track Europe still has to electrify.

Will The Trains Actually Fit?

This question is a surprisingly complex one. With a few notable exceptions on the Iberian peninsula and in the former Soviet Union, Europe has largely coalesced around 4' 8.5" standard gauge. However, loading gauges have not seen the same level of standardization. This is largely due to the fact that it is simply much harder to adjust loading gauges, as it is quite difficult to just shave two inches off the clearance of a bridge or tunnel. This is not merely a hypothetical problem: in 2014, SNCF ordered trains that were too big for a number of stations. Adding to this complexity is the recent success of double-stack trains in the US, which allow trains to carry more shipping containers. Whether or not to allow these trains is a difficult question, as they will offer more capacity, though they require massive clearances.

It's worth noting that with freight, all loading gauges are compatible with single stacked intermodal containers. Therefore, this question is more one of standardization than one of some systems having clear advantages.

Couplers

Put simply, Europe is far behind the rest of the world in its ability to assemble trains. To this day, the archaic buffer and chain coupler is still the European standard.[88] Making matters worse, it's not like the knuckle coupler–standard in other parts of the world and capable of hauling longer trains more safely with less workers–is particularly new: it was invented in the US in 1873.[89]

Introducing knuckle couplers would be great for a number of reasons. In addition to its lower labor requirements and longer trains, knuckle couplers can also take tighter curves. However, the only thing worse than a bad coupler is a coupler that doesn't fit. Therefore, coordination is even more important than choosing the best technology.

Europe must embrace modern standardized couplers, but replacing the couplers of 50,000 rail

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[88] Jaiswal, Shamiksha. "Buffers and chain coupler," Alchetron, September 2022.
https://alchetron.com/Buffers-and-chain-coupler.

[89] Burns, Adam. 2023. "Railroad Couplers in North America." American Rails. Accessed August 27, 2023.
https://www.american-rails.com/couplers.html.

vehicles overnight isn't really feasible: unlike the May 31-June 1, 1886, rail gauge standardization in the United States, this feat would require thousands of complex parts to be installed overnight.[90, 91] This is far more complicated than picking up a rail and moving it three inches. Luckily, there is precedent for railcars with dual couplers in India.[92] Using a combination of dual couplers, a few coordinated standards, and a gradual transition to modern knuckle couplers, Europe can move forward and never have to ask the question, "will these railcars fit together?" again.

Conclusion

The past generation of leaders have laid a strong foundation for the nascent ERA. They asked the question "what if a train could travel across Europe unencumbered by diverging standards" and it is up to you to answer it. They have also set a precedent for packaging standardization as a part of an upgrade in service. They have created a

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[90] Statista, "Europe (EU-28): Number of locomotives and railcars from 2009 to 2016," Statista, September 2021, accessed August 27, 2023, https://www.statista.com/statistics/453300/europe-eu-28-number-of-locomotives-and-railcars/.

[91] Southern Railfan, "The Days They Changed the Gauge," Southern Railfan, accessed August 27, 2023, http://southern.railfan.net/ties/1966/66-8/gauge.html.

[92] Wikipedia Contributors, "Coupling (railway)," McGill 2007 Schools Wikipedia Selection, 2007, accessed August 27, 2023, https://www.cs.mcgill.ca/~rwest/wikispeedia/wpcd/wp/c/Coupling_%28railway%29.htm.

niche for private industry in the process, though whether that niche is right-sized is up for debate. However, your scope is far greater and more complicated than theirs: solutions that worked on shiny new high-speed lines that governments were ready to throw money at might not work as well on a minor branch line in a recently-ascended Eastern bloc country. They also made mistakes that you can learn from—perhaps "it's an upgrade because everyone uses it but otherwise, it's the same as a system we've been using since the 1960s" isn't the best way to tell a national railroad to replace their perfectly functional signaling system. Finally, there is the question of how to allow innovation from private open-access operators while also ensuring that they meet continent-wide standards.

Bloc Positions

Introduction

The European Union is large and diverse, and has become even more so in recent years with the addition of former Eastern bloc countries. This diversity exists along many axes including language, religion, country size, and extent of infrastructure development. While the goal of standardization is key to all countries, they value different things, from bringing a large part of the standard network up to modern standards, promoting a major domestic company, or improving high-speed connections.
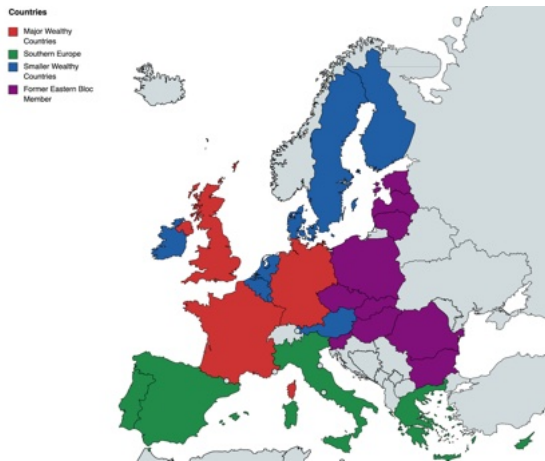
Figure 10. Blocs of Europe[93]

Major Wealthy Countries: United Kingdom, France, Germany

These countries by far stand the most to benefit from greater standardization and therefore strongly support it. A couple of reasons undergird this support, but they are wealthy major economies that stand to benefit greatly from cheaper transport to emerging markets in the east. Furthermore, the standards that the EU adopts will most likely be the ones that they already use. Finally, some of these countries, such as France (Alstom) and Germany (Siemens) have major industrial conglomerates with major interests in the rail industry who would stand to benefit from greater trans-European standardization.[94] Furthermore, these countries

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[93] Barringer, Hugh and Juan Leal-Mendoza using MapCharts.
https://www.mapchart.net/europe.html.

[94] "Top 10 Largest Rolling Stock Companies," BizVibe Blog, June 10, 2020, accessed August 27, 2023,
https://blog.bizvibe.com/blog/top-10-largest-rollin g-stock-companies.

all have strong financial institutions, meaning that their companies can get financing for any private ventures.

Smaller Wealthy Countries: Sweden, Finland, Ireland, Belgium, Netherlands, Denmark, Austria

Much like their larger counterparts, these countries have strong rail networks built out to high standards that garner high ridership. However, due to their smaller populations, their networks need not cover such vast distances. The medium-distance trips that their populations do take are routes like Amsterdam-Paris, Copenhagen-Hamburg, and Vienna-Munich. In other words, international routes. In short, these countries are some of the best-positioned to take advantage of a unified European railway.

Southern Europe: Portugal, Spain, Italy, Greece, Cyprus

These countries are at similar wealth levels and all have mountainous terrain. The bigger among them–Spain and Italy–have significant high-speed rail networks under construction, most notably the upgraded Florence-Bologna line and the Madrid-Barcelona line. Furthermore, the jump from a legacy line to a high-speed one will be greater simply because of how bad legacy lines have to be to traverse mountainous terrain: just look at the Florence-Bologna line from 1934. However, the smaller ones lack these major cities and still have the mountainous terrain that

defines Mediterranean Europe. Therefore, rail travel lags behind in these areas and upgrades are difficult. In fact, Portugal and Greece hold some of the most ignominious titles in European railroading: respectively, they saw the largest decline in passenger traffic 1990-1997 and the lowest passenger rail usage.[95] Because of all this, these countries will need strong policies that work in the context of their population and geographic region.

Former Eastern Bloc Countries: Estonia, Latvia, Lithuania, Poland, Czechia, Slovenia, Slovakia, Hungary, Romania, Bulgaria

Eastern Europe's formerly communist nations have perhaps the most difficult situation of all. First of all, they are the poorest countries in the EU, meaning that they have less money to go around. Making matters worse, many of their lines are low quality and borderline unusable. For example, over 70% of Romania's lines have top speeds of less than 80 km/h (50 mph).[96] Another element of their persistent but improving poverty is that Eastern Europe's newly-minted middle class left the railways in droves. Romania–the

worst case–saw its rail traffic fall 85%. In short, these countries would benefit from aid from wealthier EU members to help build out their networks and a clear definition of the scope of standardization that will ensure they don't break the bank upgrading lightly-used branch lines.

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[95] Hans Sterlow. "Passenger Transport by Rail 1990 - 1997." *Statistics in Focus*, February 2000. http://aei.pitt.edu/85940/1/2000.2.pdf.

[96] Marc Thomas. "Romania's General Transport Master Plan and Rail System In-Depth Analysis," European Parliament, June 2015. https://www.europarl.europa.eu/RegData/etudes/IDAN/2015/540376/IPOL_IDA(2015)540376_EN.pdf.

Bibliography

"A History of Track Gauge." *Trains Magazine*, May 1, 2006. Accessed August 27, 2023,
https://www.trains.com/trn/railroads/history/a-history-of-track-gauge/.

Barringer, Hugh and Juan Leal-Mendoza using MapCharts. https://www.mapchart.net/europe.html.

BBC News, "Who are the "A8 countries" BBC News, April 18, 2005, accessed August 27, 2023,
http://news.bbc.co.uk/2/hi/programmes/panorama/4479759.stm.

Belisa International AB, "Twenty Years of Safe Train Control in Sweden," by Harold W. Lawson, Sivert
Wallin, Berit Bryntse, and Bertil Friman, Belisa, accessed August 27, 2023,
https://web.archive.org/web/20170808154724/http://belisa.se/taag/artiklar/lawson/lawson.html.

Ben Jones. "Spain's high-speed railway revolution." *CNN*, September 7, 2021. Accessed August 27, 2023.
https://www.cnn.com/travel/article/spain-high-speed-rail-network/index.html.

"Bologna-Florence Railway." *Structurae*, accessed August 27, 2023,
https://structurae.net/en/structures/bologna-florence-railway.

"Buffers and Chain Coupler," Alchetron, September 4, 2022, accessed August 27, 2023,
https://alchetron.com/Buffers-and-chain-coupler.

Burns, Adam. 2023. "Railroad Couplers in North America." American Rails. Accessed August 27, 2023.
https://www.american-rails.com/couplers.html.

Burns, Adam. 2023. "Railroad Couplers in North America." American Rails. Accessed August 27, 2023.
https://www.american-rails.com/couplers.html.

Chitti, Marco. October 11, 2022 "A Brief Visual History of Rail Electrification." Marco Chitti's Substack.
Accessed August 27, 2022.
https://marcochitti.substack.com/p/a-brief-visual-history-of-rail-electrification.

Christian Wolmar, "Channel train opens with a breakdown," The Independent, October 20, 1994, accessed
August 27, 2023,
https://web.archive.org/web/20210109230236/https://www.independent.co.uk/news/uk/channel
-train-opens-with-a-breakdown-1444085.html.

"Council Directive 96/48/EC of 23 July 1996 on the interoperability of the trans-European high-speed rail
system," EUR-Lex - Access to European Union Law, July 23, 1996, accessed August 27, 2023,
https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31996L0048:EN:HTML.

Daniel Bowen, "Thatcher, privatisation, legacy," Daniel Bowen's diary, April 9, 2013, accessed August 27,
2023, https://danielbowen.com/2013/04/09/thatcher-privatisation-legacy/.

David Briginshaw, "Will digitalisation spur ETCS deployment in Europe?," International Railway Journal, May 1, 2018, accessed August 27, 2023, https://www.railjournal.com/opinion/will-digitalisation-spur-etcs-deployment-in-europe/.

Encyclopædia Britannica, "Channel Tunnel," Encyclopædia Britannica, August 18, 2023, accessed August 27, 2023, https://www.britannica.com/topic/Channel-Tunnel.

European Union, "Council Directive 96/48/EC of 23 July 1996 on the interoperability of the trans-European high-speed rail system," EUR-Lex - Access to European Union Law, July 23, 1996, accessed August 27, 2023, https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31996L0048:EN:HTML.

Eurostar, "About Us," Eurostar, accessed August 27, 2023, https://www.eurostar.com/us-en/about-eurostar/company-ownership.

Ferrovie dello Stato Italiane, "Milan-Bologna line: ten years of high-speed," Ferrovie dello Stato Italiane, December 13, 2018, accessed August 27, 2023, https://www.fsitaliane.it/content/fsitaliane/en/media/press-releases/2018/12/13/milan-bologna-line--ten-years-of-high-speed.html.

Hans Sterlow. "Passenger Transport by Rail 1990 - 1997." *Statistics in Focus*, February 2000. http://aei.pitt.edu/85940/1/2000.2.pdf.

Jaiswal, Shamiksha. "Buffers and chain coupler," Alchetron, September 2022. https://alchetron.com/Buffers-and-chain-coupler.

Kaiser, Warren and Stein Nielson (14 March 2008). "The Core of ATP – Data Engineering". IRSE Technical Meeting "All About ATP" Sydney. Archived from the original on 29 April 2013. Retrieved August 27, 2023. https://web.archive.org/web/20130429142912/http://irse.org.au/index.php/en/component/docman/doc_download/54-the-core-of-atp-data-engineering?Itemid=71.

La Vanguardia, "El AVE llega a Tarragona y Lleida desde Madrid y Barcelona," La Vanguardia, December 18, 2006, accessed August 27, 2023, https://web.archive.org/web/20071128032630/http://www.lavanguardia.es/gen/20061218/51297191921/noticias/el-ave-llega-a-tarragona-lleida-madrid-barcelona-jose-montilla-generalitat-fomento-campo-magdalena-alvarez-joaquim-nadal-joan-rangel-joan-clos-girona.html.

Marc Thomas. "Romania's General Transport Master Plan and Rail System In-Depth Analysis," European Parliament, June 2015. https://www.europarl.europa.eu/RegData/etudes/IDAN/2015/540376/IPOL_IDA(2015)540376_EN.pdf.

Network Rail, "Dr Beeching's Axe," Network Rail, accessed August 27, 2023, https://www.networkrail.co.uk/who-we-are/our-history/making-the-connection/dr-beechings-axe/.

Oliver Reynolds, "Railway Mania: The Largest Speculative Bubble You Never Heard Of," FocusEconomics Blog, last modified July 30, 2018, accessed August 27, 2023, https://www.focus-economics.com/blog/railway-mania-the-largest-speculative-bubble-you-never-heard-of/.

Our World in Data, "GDP per capita (current US$) - World Bank," Our World in Data, accessed August 27, 2023, https://ourworldindata.org/grapher/gdp-per-capita-worldbank?tab=chart&country=DEU~POL~HUN~CZE~SVK~SVN~EST~LTU~LVA.

Railway Technology. April 16, 2000. "Italy Rail Projects." Accessed August 27, 2023. https://www.railway-technology.com/projects/italy/.

Science Museum Group, "Standardising Time: From Railways to the Electric Telegraph," Science Museum, accessed August 27, 2023, https://www.sciencemuseum.org.uk/objects-and-stories/standardising-time-railways-and-electric-telegraph#what-was-the-effect-of-the-telegraph-on-the-railways.

"SNCF Réseau: Presentation Briefly," Internet Archive, July 4, 2017, accessed August 27, 2023, https://web.archive.org/web/20170704182225/http://www.sncf-reseau.fr/en/about/presentation/briefly.

Southern Railfan, "The Days They Changed the Gauge," Southern Railfan, accessed August 27, 2023, http://southern.railfan.net/ties/1966/66-8/gauge.html.

Statista, "Europe (EU-28): Number of locomotives and railcars from 2009 to 2016," Statista, September 2021, accessed August 27, 2023, https://www.statista.com/statistics/453300/europe-eu-28-number-of-locomotives-and-railcars/.

Statista, "Share of the rail network which is electrified in Europe," Statista, last modified August 23, 2020, accessed August 27, 2023, https://www.statista.com/statistics/451522/share-of-the-rail-network-which-is-electrified-in-europe/.

"The Apennine Tunnel." *Nature*, April 28, 1934. Accessed August 27, 2023, https://www.nature.com/articles/133644g0.

"The Country of High Speed Rail Innovation | Italy High Speed Rail." *RM Transit*, April 15, 2023. Accessed August 27, 2023. https://www.youtube.com/watch?v=-FEBMWSpIVE.

"Top 10 Largest Rolling Stock Companies," BizVibe Blog, June 10, 2020, accessed August 27, 2023, https://blog.bizvibe.com/blog/top-10-largest-rolling-stock-companies.

University of Barcelona, "European TGV Network (As of 1999)," University of Barcelona, accessed August 27, 2023, http://www.ub.edu/medame/tgvmap.jpg.

Wikimedia Commons contributors, "Europe rail electrification map," Wikimedia Commons, last modified September 6, 2022, accessed August 27, 2023, https://commons.wikimedia.org/wiki/File:Europe_rail_electrification_en.svg.

Wikipedia, The Free Encyclopedia, "List of countries by rail transport network size," Wikipedia, accessed August 27, 2023, https://en.wikipedia.org/wiki/List_of_countries_by_rail_transport_network_size.

Wikipedia Contributors, "Coupling (railway)," McGill 2007 Schools Wikipedia Selection, 2007, accessed August 27, 2023, https://www.cs.mcgill.ca/~rwest/wikispeedia/wpcd/wp/c/Coupling_%28railway%29.htm.