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An Overview of Sustainability-Related Strengths and Weaknesses of Night Trains in Europe

Katia Hueso Kortekaas*

Department of Mechanical Engineering, ICAI School of Engineering, Comillas Pontifical University, Spain

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***Corresponding author:** Katia Hueso-Kortekaas, Department of Mechanical Engineering, ICAI School of Engineering, Comillas Pontifical University, Spain Email: khueso@icai.comillas.edu

Abstract

Night trains are being revived in Europe, after decades of neglect and massive closure of lines. One of the main arguments used by companies and public authorities is that they are more practical, comfortable, and environmentally friendly. This study looks at the environmental, economic, and social aspects of night trains in Europe, to assess their overall sustainability. Since night trains run on existing infrastructure, it looks at their specific strengths, weaknesses but also opportunities and threats of this specific industry. For the environmental aspects, it focuses on the impacts of emissions, energy use, noise and vibrations and land use. For the economic aspects, the main issues are operational costs, employment, and pricing. The social issues addressed are quality of travel time, comfort, and safety. Given the broad geographic and thematic scope, this study provided a general overview, as obtained from the relevant literature. The main sources examined are scientific, technical and policy reports on cross border night trains in Europe. The results indicate that, while night trains are clearly sustainable from the environmental point of view, there are significant economic challenges to solve to make them competitive against other alternatives. The social aspects, being somewhat subjective, may be solved more easily with adequate information and awareness raising. Overall, it can be concluded that night trains are a viable and sustainable form of transportation, once the economic challenges are addressed, ideas to achieve this are also provided.

Keywords: Nigh trains; Rail travel; Sustainability; European Railways; Habitat fragmentation

Abbreviations: TAC: Track Access Charges; PSO: Public Service Obligation; VAT: Value Added Tax; VLDNT: Very Long- Distance Night Trains; SERA: Single European Railway Area

Introduction

Since their inception in the nineteenth century, trains have consistently been a popular option of transportation, compared to automobiles and airplanes, which were more recent additions to the industry. Sleeper or night trains are a specific passenger rail modality that is described as "any train consisting partly or wholly of rolling stock dedicated to, or reconfigured for, overnight travel" [1]. More specifically, it is "a train running for at least seven hours including the 2 am to 5 am segment and conveying berths and/or beds" [2]. Thanks to advancements in technology, simplification of cross-border formalities and the expansion of the European rail system, night trains became a comfortable and efficient way to travel long distances, reaching an all-time high demand in the early 20th century.

The onset of World War II, combined with innovations in the aviation and automobile industries and their associated infrastructure, led to a diminished use of night trains across Europe in favor of planes and cars as a preferred method of transportation. Night trains became economically infeasible due to competition from less expensive and heavily subsidized alternatives, a rise in operating costs, and a lower passenger yield; they were further limited by changes in social norms, which turned the public away from night trains [3]. As a result, starting in the 1980s, countries across Europe have either outright eliminated specific night train routes or shortened them, both domestically and internationally. The privatization of train companies, segmentation of services, and increase in safety and operational protocols have further complicated crossing rail borders [4], an issue that was not exceedingly problematic before. At the turn of the millennium, the rise of low-cost airlines, expansion of high-speed rail, and the relatively higher operation costs with respect to day trains, have further contributed to their demise. The offer of night trains reached its lowest point in 2016, with the withdrawal of all overnight services by DB (Deutsche Bahn, the German national railway company). The SNCF (Société Nationale des Chemins de Fer Français, its French counterpart) eliminated most

of its services by then as well. Arguing the 2020 pandemic as the culprit, Renfe and CP (Red Nacional de Ferrocarriles Españoles and Comboios de Portugal, the Spanish and Portuguese national operators, respectively) also eliminated their remaining sleeper train services. Overall, the number of night train services between 2001 and 2021 in Europe fell by 65% and the high-speed services increased by 95% [5].

In recent years, supported in part by the European Green Deal and UNFCCC's Paris Agreement, rail has been highlighted as an alternative method to other means of transportation because of its perceived sustainability [3,6]. The European Year of Rail 2021 was presented as an opportunity to boost European railways as clean, safe and convenient transport for all, as rail had been estimated to represent only around 10% of collective cross-border passenger transport in Europe [5]. Partly pushed by the flygskam movement, there is an increasing public demand to revive night trains within Europe [7]. Access to rail on the continent should be relatively easy, as more than eight out of ten Europeans live within 30 minutes of a railway station (83%) [8]. Rail, therefore, provides a feasible alternative for passengers looking to optimize their time and remain environmentally conscious. However, environmental awareness will not solve most challenges that affect the feasibility of night trains. Therefore, this contribution seeks to provide a critical analysis of the sustainability of modern night trains in Europe and offer ideas for improvement that may contribute to their recovery. The sustainability analysis is based on the environmental, social, and economic aspects that have been identified as most relevant for railroads and train travel by different authors [9-11] (Figure 1) and have been selected for night trains that (may) run on existing lines. It thereby excludes impact related to the construction of new infrastructure and the embodied impact of existing infrastructure and of trains themselves. Given the breadth of the thematic and geographic scope of this work, it is not possible to cover in detail the sustainability aspects of the rolling stock, as varied as it can be. The focus thus lies on the aspects that are specific of night train as opposed to other day services, whether high-speed or conventional. The analysis follows the triple bottom line or weak sustainability model, because of its mainstream use and understanding by most economic sectors [12] and considers the three pillars of environment, economy, and society as its basic and equal components. A general overview of essential aspects that contribute to sustainability of night trains is provided, suggesting pathways for future and more detailed analysis.

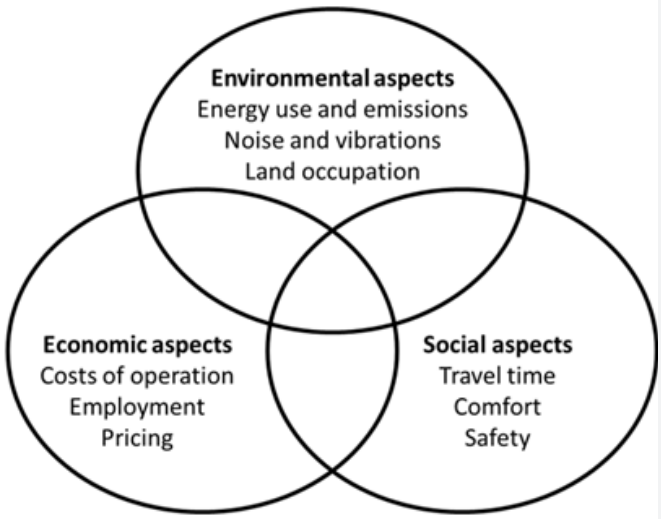

Figure 1: Main sustainability aspects of night trains discussed in this contribution.

This paper also investigates the sustainability related strengths for the implementation of night trains as a mode of transportation for long distance travel across Europe, while also identifying potential weaknesses for consideration and improvement. The environmental sustainability of night trains compared to transportation by means of automobiles and airplanes is also addressed. The economic viability of night trains is considered through the investigation of European policies and research on the three indicator categories chosen (Figure 1). In addition, the social implications of train travel as such, as well as compared to airplanes and cars, factor into this examination. While many authors have addressed these topics, few if any provide an overview of the three pillars of sustainability as offered here in the context of night trains. With this work, sustainability as a concept can be used to understand the contribution and challenges night trains present as a re-emerging mode of transport that can very well add up to the current offer of conventional and high-speed daytime services. In this context, night trains are seen not as competition but as an alternative that has distinct features and possibilities and diversifies the commercial offer of rail companies

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to their customers. They have traditionally been labelled as niche market or ridiculed as a product of nostalgia, but this analysis intends to showcase them as a viable, sustainable alternative for long distance mobility. The three pillars of sustainability of night trains are briefly discussed below, to offer a thematic framework of the essential challenges that they face today. In the results and discussion sections, these challenges are addressed in further detail, and suggestions for improvement indicated.

Environmental Component of Night Trains

The most important environmental impacts of railroads are related to energy use, emissions, noise and vibrations and land occupation. However, compared to other modes of transport, trains usually perform better in all three aspects. Energy use and its associated emissions is perhaps the most relevant impact, although numerous variables affect their intensity, such as type of engine, passenger capacity per vehicle, state of the rails, slopes, curves, speed, or the source of the energy used. The complexity of calculating emissions is further aggravated by national regulations, measurement methods, data provision, and transparency per country [10]. The challenge of being precise, in the case of cross-border night trains, is therefore huge. Noise and vibrations are nuisances that affect locally to neighboring communities and wildlife. They are especially relevant in the case of night trains, given that they travel during the quietest hours of the day. The choice of rolling stock, speed and state of the infrastructure greatly influence this aspect, again proving it difficult to provide general figures [13,14]. Another environmental impact to consider is land occupation. On the one hand, is the space needed for infrastructure that greatly affects urban communities, especially around stations. This is not significant in the case of night trains running on existing lines, as they do not require additional tracks of significant infrastructure changes. At stations there may be a need to open or lengthen the opening times of waiting rooms, restrooms, restaurants, and other facilities, but these do not affect occupation as such. On the other hand, is the physical disturbance to the wildlife and rural communities in the form of habitat fragmentation, which again will not increase from the baseline situation. However, the passage of night trains will especially affect nocturnal animals that need to roam in search of prey or whose migratory path has been cut by the railroad. Collisions with wildlife and domestic animals are common, especially in unprotected, conventional lines and need to be assessed [15,16].

Economic and Policy Component of Night Trains

One of the biggest challenges for the sustainability of night trains is their cost of operation. Not only are trains expensive vehicles (the price of a new sleeper car can reach 2 million euros, [17]), but availability is limited. Buying second hand, renting or leasing sleeper cars are possibilities that may increase their availability. Once on the rails, the use of the infrastructure requires the payment of Track Access Charges or TAC. Payment of staff, both on board and on the ground, is needed, and the salaries of night shift workers are generally higher. Maintaining, repairing, refurbishing, upgrading, cleaning, and preparing cars and engines for travel are also costly operations. The pricing of train tickets is a complex issue. Some trains run under the Public Service Obligation or PSO scheme, which guarantees public transportation in areas or lines with low demand. This often means they need to be subsidized. Others run in the open access market, competing with other companies in what should be a level playing field. Most train companies use dynamic pricing, to adapt to the demand and increase their revenue. Lastly, taxation (especially VAT) varies between countries, complicating the pricing of international tickets.

Social Component of Night Trains

An important consideration in the implementation of night trains is the examination of the subjective perception of these services and how this influences decision-making among consumers. There are several significant factors that influence the intention to take a night train: environmental attitudes, subjective perception of price and comfort, safety, cleanliness, and familiarity with the night train service [18-20), but, from the social point of view, travel time and comfort are those that most influence consumer decisions [21]. Travel time is an elastic concept that goes beyond the real duration of the journey, as it should include the total time needed to go from door to door, and not just the main leg of the journey, regardless of the means used. The quality of the time spent travelling (both onboard the train and on stations) also influences in the passenger´s perception of its use. Comfort and safety are also crucial aspects of night travel. Also, spending the night in a moving vehicle in the company of strangers requires protocols and social norms that ensure a positive perception of safety and cleanliness among passengers. In addition, the diversity of passengers, which have different needs and expectations, must be considered. Therefore, understanding the different personal travel habits of passengers is key; passengers should be seen as "multifaceted customers" [22].

Material and Methods

The goal of this paper is to analyze night trains in the light of sustainability. Night train-specific environmental, economic, and political/social components of their sustainability are addressed and, in some cases, compared with those of other modes of transportation. Although "not travelling" could be interpreted as the most sustainable alternative to travel, this contribution does not consider it as an option. For this analysis, literature on the environmental, economic, and social aspects of night trains as well as passenger trains in general has been searched. Whenever relevant, a comparison with alternative modes such as cars and airplanes has been seeked. The sources for this paper are obtained from the Web of Science and Google Scholar engines using Boolean operators to search keyword strings. Examples of

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such strings include the words "night trains" and "environment*", "soci*", or "econom*". In addition, the University of Florida and University of Illinois library databases have been utilized for supplementary articles. The combination of these databases allowed for the detection of a larger diversity of documents, beyond the academic realm. The search has thus included not only scholarly work, but also policy and industry-related documents. Also, given the recent public interest in the topic and relatively scarce scientific literature on the sustainability of night trains, the search has also included master's and doctoral theses. Specialized media outlets such as Railway Gazette, Rail Tech, International Railway Journal or Global Railway Review as well as dedicated NGOs (e.g., Oui au Train de Nuit, Back-on-Track Europe, Transport & The Environment) have been consulted. In all cases, a snowball method of expanding the search has been used. Given the broad thematic and geographic scope of the topics addressed, the search has focused on general works and specific case studies, unless deemed representative, have been disregarded. Using the results of the literature study, a SWOT analysis has been performed of each sustainability axis, to identify challenges and strengths of night trains and contribute to the discussion of those aspects that need improvement (Figure 2).

Figure 2: A berth compartment with six bunk beds (Photo: K. Hueso-Kortekaas, 2022).

Results

Environmental sustainability analysis

i. Energy use and emissions

Ever since emissions have been tracked, they have steadily increased over time. In the European Union, the transportation industry accounts for 29% of greenhouse gas emissions and has increased by 33% since 1990. Of that percentage, the automotive sector, composed of passenger cars, vans, trucks and buses, is responsible for the large majority at 20%, followed by 4% each from the shipping and aviation industries, and 1% from motorcycles, rail, and other modes [23]. According to other calculations, 72% of global transport emissions come from road vehicles, which accounted for 80% of the rise in emissions from 1970 to 2010 [24]. Also, a case study of Germany, Aamaas et al. [25] estimated that trips over 100 kilometers contributed with 51% of all emissions from passenger travel. Airplanes are not the largest threat to the environment based on this data, but their performance is extremely inefficient and costly to the environment. This is because of the high altitudes they fly at, which cause emissions to have a stronger effect on global warming as compared with the other means of transport on land. As a result,

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air travel has an average of 28 times higher climate impact than night trains [2]. In addition, electric trains do not pollute on site and have a higher average passenger capacity than buses and airplanes. Some also run on renewable energy, which lowers their emissions per capita even further [26,27).

Eco-audits and similar analyses have been regularly performed to compare the emissions of different modes of transport, such as airplanes, trains, and automobiles [10,28,29]. The emissions data per person for all three modes of transportation depend on many different factors, such as the energy source used to fuel the engines, passenger capacity, and distance covered. On average, commercial airplanes traveling 500 km and 1,000 km emitted 340 gCO_2/pkm and 270 gCO_2/pkm, respectively. The potential reduction in CO_2 from intra-European aviation, by a modal shift from air travel to railways, is estimated at 4 to 7 million tons [23]. Passenger cars, on the other hand, emitted 111 gCO_2/pkm, and conventional international passenger trains emitted 12 gCO_2/pkm in Europe [10]. This data showcases that rail transportation is far more environmentally sustainable than air travel and automobiles, and it aligns with the earlier claim that conventional rail travel and travel by sleeper train is 22 - 28 times more climate friendly than air travel. The source of energy has a large impact on the emissions data for each mode of transport. It is known that electric cars contribute to global emissions with 26 gCO_2/pkm, a significantly lower figure than the 111 gCO_2/pkm emitted by conventional fossil-fuel cars. This variation of emission rates due to the energy source is reflected in train travel as well. Trains are powered in different ways. For example, the French are dependent on nuclear power, Swedish and Dutch ones obtain power from renewable sources, and Scottish trains use diesel fuel, which is less environmentally friendly. Spanish trains offset their emissions, but still use an energy mix to run them [30]. Incidentally, energy consumption per train-kilometre for night trains is about half that of day trains [31] mainly because of their lower average speeds and fewer stops (that would imply acceleration efforts upon departure).

Another factor that affects the energy use of these various modes of transportation is their occupation [30]. The average occupancy rates for each of these modes of transport are 80% for air travel, 1.5 pax for passenger automobiles, and 70% for international rail travel. For night trains specifically, this is not a favorable metric because they have lower passenger capacity per car than conventional or high-speed rail modes due to their design, which emphasizes passenger comfort. Generally, there are less passengers occupying the space because they are designed for most passengers to sleep in bunks or beds. Commercial airplanes, buses, and high-speed trains all have higher capacity, which allows them to distribute the environmental effects more widely per person. Distance traveled also has an impact on environmental sustainability for these transport modes, especially for airplanes. Short haul flights have a significantly worse environmental performance than long distances flights, since emissions during landing and take-off are highest, and the type of plane used to fly short distances is generally less fuel-efficient. This is relevant, since most of the air travel in Europe is shorter than 1,000 km, and these short- to mid-distance flights have a more detrimental climate impact [30]. According to different authors, day trains can replace flights up to 400 km, whereas night trains can up this to 800-1,200 km, with a journey duration of 10 to 12 hours [26,32] (Bruno 2022). In a comparison study based on data from 2019, from the top-150 intra-EU routes by air, only 2% could not be covered by train and 86% of routes under 3,000 km of length could be travelled by train, either directly or with a maximum of two transfers. Of these, 39% could be covered by night train specifically [33].

ii. Noise and vibrations

Noise pollution from trains is a well-known problem. In general, trains traveling between 250 and 350 km/hour produce around 87 dB. Sound intensity values in the range of 65-75 dB are already considered noise pollution. Excessive noise pollution among high-speed trains has been shown to affect acoustic communication between certain bird species [13]. Typically, birds will produce sounds to attract mates and/or communicate with each other. Persistent noise from trains, especially during mating season, can lead to accelerated hatching, abandonment of nests, and hearing loss. The existence of noise pollution can create a non-physical barrier separating certain bird species, as flocks will avoid flying near railways that produce excessive noise. Some, however, have adapted to the noise pollution or even prefer to live near human infrastructure, it appears that trains passing at regular intervals are predictable and do not scare them [34]. For humans, long term exposure to railroad noise can also cause negative health outcomes, such as sleeplessness, irritability, stress, or headaches, which in the long run may lead to cardiovascular diseases [14]. However, given the scarcity of passenger night train traffic, most studies on the effect of nocturnal railway noise have been performed with field data or simulations of freight trains, notably producing more noise and vibrations than passenger trains normally do. In addition, sleeper trains run once or twice nightly per line, therefore are not expected to cause major disturbances [35,36].

iii. Land occupation and habitat fragmentation

As with most forms of land-based transportation that require infrastructure, there are certain risks of habitat loss and damage from railroads. Installation of tracks, electrical lines, and especially fences can prevent the movement of animals across a given natural area, fracturing it, and damaging the ecological community [37], creating a barrier effect. High-speed tracks are fenced all along the line and therefore significantly contribute to this effect. The fences are installed indeed to prevent collisions with wildlife and livestock, although it should be noted that they do not fully eliminate animal mortality related to train collisions. Meant for larger species, smaller animals can cross them anyway,

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resulting in an estimated 92 vertebrates killed/km/year in Spain only [15,38] Contrary to high-speed trains, night trains tend to travel on already existing conventional unfenced infrastructure, minimizing the impact of new lines and fences. Despite not being protected, their relatively lower speed reduces the risk of collision. Also, as compared to roads and motorways, conventional railroad tracks do not require as much land clearing to function, and some of the routes still allow animals to cross freely, which minimizes habitat fragmentation [15]. Roads and especially motorways, as they require more surface per kilometer, further disrupt the movements of wildlife, unable to cross these infrastructures easily and therefore have a significantly higher risk of collision. Table 1 summarizes the strengths and challenges of night trains from the point of view of their specific environmental impacts, namely energy use, emissions, noise and vibrations, and land use. As can be seen, the strengths outweigh the weaknesses, but threats are more problematic to address, as they need long-term and heavy investment. From the environmental point of view, night trains run on already existing lines and do not need new infrastructure. Their emissions are relatively low, as compared to other modes of transport, and one single trainset serves multiple destinations. Relative low occupancy makes night trains, however, less efficient from the point of view of energy use and emissions per passenger.

Table 1: SWOT analysis of the environmental aspects of the sustainability of night trains.

Strengths	Weaknesses
Energy use and emissions Growing use of energy from renewable resources Emissions from electric trains are produced elsewhere. **Noise and vibrations** Passenger (night) trains usually less noisy than freight or high-speed trains Few night trains passing per line, per night **Land occupation** Conventional lines already exist and occupy less land than highways of high-speed lines **Energy use and emissions** Potential for full renewable energy use. Emissions can be greatly reduced. **Noise and vibrations** New rolling stock generates less noise and vibrations **Land occupation** Existing, conventional lines can be used	**Energy use and emissions** Diesel trains still common Direct emissions from diesel trains Lower relative occupation of night trains mean higher relative emissions per train **Noise and vibrations** Noise and vibrations from night trains more noticeable than day services **Land occupation** Risk of collision with wildlife **Energy use and emissions** Transition to electrification and renewable energy use costly and long- lasting **Noise and vibrations** Renewal of rolling stock and infrastructure is expensive and needs time **Land occupation** Night trains heighten the risk of collision with nocturnal animals

Economic sustainability analysis

i. Cost of operation

Often, night trains are more expensive than air travel per distance covered, and this is due to a wide variety of factors [2]. Among these are the higher unit maintenance costs of berths, beds, etc., lower occupation per carriage resulting in more fuel and energy usage per passenger, and higher operating costs for staff, discussed in more detail below [1]. But perhaps the single most relevant factor is the uneven payment for the use of infrastructure.

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Trains pay hefty track access charges (TAC), whereas airlines or cars pay much less, in relative terms. TAC are fully covered by the operator, accounting for up to 88% of operating costs [39]. The fees increase along with the distance traveled. For instance, longer routes, such as Amsterdam to Madrid (2,286 km), will add a significant cost to consumer ticket prices due to the heavy weight of TAC [2]. This makes competition with other modes of transport, such as airplanes and buses, very steep [40].

Indeed, uneven competition with air travel is especially harmful for night trains. The boom of Europe's aviation industry began in the 1990's when the EU first opened its market for competition in 1992, with full market liberalization in 1997 [41]. This paved the way for low-cost airlines to emerge. Since their inception, these airlines have experienced massive levels of growth over the years. Part of this rapid expansion is due to the plethora of subsidies from the EU and national governments that have allowed low-cost airlines to sell very inexpensive tickets to consumers. Perhaps the most significant subsidy is that the fuel is completely tax-free, which is not the case for any other mode of transport. Finally, airplane tickets do not have VAT, anywhere within the EU [42]. The combination of these economic grants to the air industry keeps the costs for travel by air down significantly; however, there is no accountability for the high CO_2 emissions or other externalities such as noise or pollution produced by aircraft. Lagging, in this respect, is the rail industry: the Fourth Railway Package only opened the whole rail transport market to competition in 2022 and de facto private competition in passenger services is still in its infancy [43].

The need for a rolling stock adapted to night travel, mentioned above, also strains the operational costs. The new material must also comply with many technical requirements, such as certain quality standards, which may differ per country, or even the capacity to change bogies or adapt to different gauge widths found in Europe [2]. These technicalities of the vehicles impact the manufacturing, maintenance, and repairs costs, which in turn increases the ticket price for the passengers. Another challenge is the availability itself of rolling stock for these trains, as they are very specific, and cannot be used in other types of services. They can take up to two years to construct. Unlike airplanes, the second-hand market for this type of car is limited, since most recently decommissioned night trains are very outdated at this point and too costly to upgrade. Either they have been refurbished into day train configurations or they are past the point of reconstruction, so fleets must be created entirely anew [3]. Renting or leasing are options that smaller companies are now using to solve the issue. To understand the scale of the problem of availability of rolling stock, the French association Oui au Train de Nuit has envisioned 30 new night train connections across Europe, with an estimated 10 million potential passengers per year. An extrapolation based on existing fleets, between 5,000 and 20,000 new coaches would be needed. For night trains running today in the continent, around 1,500 couchette and sleeping cars exist [31,32].

The costs of running night trains versus high-speed trains have been well outlined in an analysis on these services provided by SNCF, published by railway analyst Jon Worth. Once costs are set against revenues, TGV trains break even at 50% occupancy (and have an average occupancy of 80%), while night trains need 65% to break even (with an average occupancy of 70%). Considering also that TGVs have a capacity of 500 passengers versus the 300 that can travel on a night train, the loss of profitability is even higher. This is easily explained by the author in an example: Two TGVs running with 500 seats each and an average occupancy 80% (that is, a total of 800 passengers) has a higher profit than two TGVs and one night train, with an average occupancy of 70% (that is, a total of 910 passengers) [44]. Today, airlines can offer travel over great circle distances of 500-800 kilometers for around half the cost of night trains while coaches can offer travel for half the cost overnight trains [31]. However, if externalities are considered, the costs caused by rail to society (in term of environmental impact, nuisances, etc.) are very low compared to other transport modes. This aspect is only partially reflected in the actual costs and taxation of the various modes [5]. Some authors argue that night trains have an additional disadvantage with respect to their competitiveness, compared with day services, because they can only run once a day (or night, rather). However, given the distances travelled, it cannot be expected that day trains can multiply the number of round trips, rendering this argument fallacious form the point of view of number of services (but not, however, from the point of view of their capacity) [1]. Likewise, one could argue that there could be several day trains running with different departure times (e.g., an early vs a late one), but this is also the case with night services, provided there is sufficient demand.

There are several technical issues that hamper night trains. For international routes, cross border rail connections imply differences in regulations, safety, scheduling, and compatibility with maintenance operations or other forms of traffic such as freight usually performed at night. This results in the need to reschedule workplans and crews and lengthen nuisances to residents and passengers [1]. They also may interfere with very early or late commuter services, further congesting the lines. Added to this, there is a diversity of track gauges across the continent (e.g., the Iberian Peninsula, the former Soviet states and Ireland differ from the international standard gauge). In the case of Spain, also due to the increasing abandonment of conventional lines, the use of high-speed lines –which have international standard gauge– could prove as a solution for night trains. However, many dedicated high-speed lines cannot be used by night trains, for reasons including steep gradients, maximum permitted axle weights, incompatible signaling, and specific safety rules [31]. In addition, night trains are hauled and need locomotives, instead of being self-propelled multiple-unit, with a push-pull systems that allow quicker turnaround times, reduced crewing costs, and enhanced safety. On the other hand, locomotive-hauled trains have the advantage of being able to split or join end route,

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saving the costs of needing separate trains for each branch and being able to multiply the offer of destinations. Also, night trains running on conventional lines can also serve mid-sized cities that are typically by-passed by high-speed rail services [45].

ii. Employment

Staffing night trains involves higher costs than daytime crews. First, because of the higher salaries needed to compensate for working night shifts. Second, the crew members travel the whole length of the journey, therefore spending time away from their home base, which requires longer rest times, (hotel, residential) accommodation and per diem costs. On day services, schedules are organized in a way that staff can commute to and from home, with shorter shifts. Also, the staff-to-passenger ratio is higher on night trains, due to the specialized tasks they need to perform, such as cleaning, making beds or serving breakfast. For instance, the cleaning process required after each journey is more intensive as it involves different types of carriages, materials (e.g., bedding) and on-board facilities. This needs longer and more specialized training. On international trains, staff will also be required to speak several languages, therefore needing more training, or demanding higher salaries [3]. Aside from train staff accompanying passengers, there is a significant number of technical staff needed at night, both on board and on the ground, such as engineers, mechanics, station masters, and other staff required for the smooth running of the service. Night trains require a second driver to comply with safety rules. If the night train splits en route, additional employees are needed for coupling and decoupling cars, shunting engines, etc. This is further complicated in international routes, which may have different protocols in place for all these operations and a variety of contractual legal requirements for hiring new employees [46].

iii. Pricing

Although comfort is a very important metric customers consider, the economic aspect is one of the most important factors in the eyes of a traveler. This is a combination of affordability (i.e., price of the ticket), savings (i.e., accommodation costs) and added value (i.e., comfort, quality time) [7]. In a Europe-wide poll, 63% of respondents declared willingness to travel by night train if it was available at a reasonable price. Interestingly, this percentage rose to 80% in Spain (the poll was taken in the year of the final closure of all night trains in the Iberian Peninsula) [47]. Night trains, however, have a challenging business model, which makes it more difficult to reduce ticket prices and compete with the low-cost airlines or even day trains, reducing their affordability. Their strength lies in the perception of saving and added value the public may have, both more subjective metrics.

An economic aspect that may seem contradictory in the light of privatization and free competition via open access rail services, is the public service obligation (PSO) that most transport companies are committed to. The Fourth Railway Package of the EU [48] establishes that: "The liberalization of domestic rail passenger services covers both open access rights for any passenger services provided it does not compromise the economic equilibrium of existing public service contracts and common rules for the competitive tendering of public service contracts for passenger transport by rail." Thus, open competition and public service obligation co-exist in a delicate balance in many EU member states, often considering night trains purely competitive (within a niche market) rather than PSO-worth [49]. Therefore, passengers must cover all the costs with their tickets, including the TAC. Differences in taxation, such as Value Added Tax (VAT), on tickets, further complicates pricing: VAT on tickets still applies in some countries within the EU, and most journeys on night trains are international, therefore VAT will most likely increase the ticket price [2,50]. In addition, international routes do not always fall withing special offers, discount prices, packages, or frequent-user schemes that national rail companies usually offer. With the advent of specialized private companies offering sleeper services (e.g., European Sleeper, from The Netherlands; Moonlight Express, from Belgium; and Midnight Trains, from France) competition is expected to get a boost but will need to cover the operational costs solely or at least mainly from their ticket sales. Currently, night trains are unevenly competing with other forms of transport that offer extremely discounted tickets mostly because of subsidies [51].

From the savings point of view, passengers value the idea that they do not have to pay for accommodation for the nights spent travelling. Of course, depending on the class chosen, the comfort level will be added to the price of the ticket, often in the form of a supplement. Passengers are also aware of saving the cost of the ride to and from the airport, usually higher than to and from the station. Being able to carry an almost unlimited amount of luggage, as long as one can haul it, is also a perk with economic advantages, since rail companies do not usually charge extra for it. Transporting odd sized luggage, bicycles, sports equipment or even pets is usually much cheaper or even free by train than by airplane [52]. In Table 2, the strengths, weaknesses, opportunities, and threats of night trains from the point of view of their specific economic aspects can be seen, such as cost of operation, employment or pricing. This is the most challenging sustainability axis for night trains, given the high operating costs mainly due to TAC and VAT, as well as the investment needed to build or even renew rolling stocks. Pricing and booking across countries are complex and need significant simplification for the customer, to increase competitivity, especially compared with aviation. So far, only very convinced customers (mainly for environmental reasons, a few for practical or even emotional reasons) chose night trains for business or leisure travel.

Social Sustainability Analysis

i. Travel time

As said earlier, cost and travel time were the most important considerations of customers when deciding between different modes of transportation for medium and long-distance journeys

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[7]. If overall travel time is considered, trains have the general advantage of shortening the first and final legs of the journey, as railway stations tend to be more centrally located than airports. Also, night travel can be considered more efficient, as most of the time needed to cover the journey will be spent asleep. Passengers also prioritize arriving well rested at their destination, and being able to start whatever activity brings them there, right away. The quality of travel time also includes timing, that is, scheduling. In the definition provided above, night trains are considered as such when they cover the whole night, not forcing passengers to board or deboard at odd times. Also, punctuality and reliability are considered decision making factors, especially for passengers who travel for business, to events, or any other purpose that requires arriving on time [3,7). Finally, frequency is another metric that is considered. Some companies run on specific days (e.g., around weekends or public holidays), others only seasonally (summer for beach destinations, winter for alpine towns) and yet others do so on alternate days, as only one train set operates the route. However, it is a well-known axiom in public transportation policy that an increase in frequency leads to higher demand and use [53].

Table 2: SWOT analysis of the economic aspects of the sustainability of night trains.

Strengths	Weaknesses
Cost of operation Private operators may be more flexible in their business. **Employment** Night train staff better trained and more flexible mobility. **Pricing** Night travel saves hotel nights. Price includes different quality classes, which are valued by customers? Travel to/from the station usuallycheaper than to/from airport.	**Cost of operation** Track Access Charges are hefty andcreate. an uneven playing field for night trains. TAC for night trains is furtherpenalized due to the distances travelled. VAT on most trains Technical differences between countries (signaling, electrification, protocols…) **Employment** Higher cost of salaries of night trainstaff Need specific training and certification. schemes for staff **Pricing** Prices reflect operational costs but donot include positive externalities.
Opportunities	**Threats**
Cost of operation Leasing and renting rolling stock, rather than owning it. Consider (some) train routes a Public Service Obligation **Employment** International training and mobility schemes for staff. **Pricing** Including externalities in all modes of transport is a fairer pricing policy. Enhance the perception of savings among passengers (as compared to other modes)	**Cost of operation** Difficulty to reduce VAT and TAC across the continent. Lack of available rolling stock for night trains. **Employment** Lack of willingness to work at nightand/or far from home. **Pricing** A level playing field in pricing is notlikely soon.

In terms of travel time and expenses, the above cited survey found that typically passengers with higher income rated night trains as a much less comfortable form of travel. Those traveling for business would rather fly in the evening before and pay hotel fees. Interestingly, the time of arrival also affected people's preferences to take night trains. Early morning arrival (8:00) lead

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to a slight desire to take night trains but a late morning arrival (10:00) lead to a preference for morning flights [54]. Younger passengers, however, respond to the appeal of night trains as the appropriate environmental alternative over more traditional forms of transportation [7]. Unlike the common narrative in the press, companies running night trains steer clear of the discourse of nostalgia, and address passengers who want to use them for practical reasons. Despite despising nostalgia –usually fed by personal and collective memories and familiarity– and similar arguments in favor of trains, such as freedom to move around while aboard, socialize, relax, or their perceived pleasant ambience and flair, companies should also be aware of the fact that passengers tend to emotionally favor trains over other modes of transportation, even if other, "harder" indicators are against (e.g., price, speed, connectivity). Many passengers perceive the journey as enjoyable, value the possibility to spend "quiet time" in trains or even sense a more "organic" form of speed and motion in them [55,56). Night trains are especially well suited to cater for these qualitative needs. Lastly, the booking process is also considered part of the quality of the journey. Compared to airlines, train booking systems are often criticized for being complex, unreliable (especially in the event of missed connections, rerouting, and cancellations), uncoordinated, and short-term. Booking sites are limited in geographical scope, passengers needing to visit multiple sites for longer, cross-border journeys. Tickets are being sold a few weeks or a couple of months in advance, making long-term planning more difficult.

ii. Comfort

Accessibility, frequency, safety and cleanliness are aspects that influence satisfaction of European rail travelers [8]. Night trains should cater for many different types of passengers and their needs and wishes. Travelling in packed 6-berth compartments is gradually being perceived as uncomfortable, due to the cramped space and lack of privacy. While older adults may have experienced this form of travel and look back upon it with friendly eyes, modern passengers may not appreciate them in the same way. In a recent survey, passengers generally preferred less people within their sleeping compartment. Sharing with one other person in comparison to sharing with five other people resulted in a significant difference in preference. Switching from a sleeper car to seated accommodation was even less preferred. The addition of a food/beverage option for passengers improved ratings, whereas increasing the number of stops decreased them [3]. Public transportation forces passengers to adhere to strict social norms, to ensure a peaceful sharing of the public space, each type of vehicle having its own set of unwritten rules. From this perspective, people tend to prefer trains over airplanes, because they offer some more freedom of movement and an ever so slightly higher degree of privacy. If possible, passengers tend to use part of their belongings to limit their personal space, such as coats, scarves or books [57]. The use of electronic devices with the sound on is frowned upon, as are loud conversations and activities, but night trains are spaces where there is a bit more flexibility in these norms. Passengers find themselves in a more relaxed state of mind, off working hours, and this facilitates a more informal social exchange. Trains are one of the few public spaces in which private activities such as sleeping, changing clothes or washing are tolerated and, in some cases, done in the presence of strangers, although some people may feel uncomfortable in this situation [58]. Of course, the higher the class chosen; the more privacy is ensured.

Today's night trains essentially offer three comfort classes: sleeper cabins (also known as wagon-lits or Schlafwagen), berth compartments (also known as couchettes or Liegewagen) and seated cars (airline-style or in 6- or 8-pax compartments). Sleeper cars offer in turn different levels of comfort and occupancy, depending on the company, and may cater for everything from individual travelers to small groups per cabin. Berths are a more spartan form of accommodation, usually for 4 or 6 passengers per compartment. In some cases, there are female-only compartments. Seated cars may offer slight differences in comfort, but the seats usually recline, have footrests, and feature foldable tables. In most sleeper and berth cars, breakfast is offered. This diversity of levels of comfort accommodates many profiles of passengers, which include business travelers, families, backpackers, persons with disabilities, or special interest groups such as foodies, environmentalists, sportspeople, or train buffs [56]. Specific facilities may exist for families, infants, groups and pets, including also multipurpose cars or room for storage of bicycles, skis, and other odd sized luggage. Passengers with mobility issues are also catered for, with specific sleeper compartments in some cases (pers. obs.).

iii. Safety

Safety on trains is a priority among passengers. While the level of comfort is a choice, safety is for most passengers a must and their concerns may affect their final decision of preferred mode of transportation. A survey on passenger perception of railway safety identified the factors that affected them most. The risk of losing their luggage was seen by 61% as a key problem. Additionally, 47% saw lack of storage as something that decreased their perception of safety [59]. In fact, some night train seated cars offer padlocks or tiny lockers to store valuables while passengers doze (e.g., Caledonian Sleeper, pers. obs.). Another important consideration is the impact safety (or lack thereof) has on marginalized groups. A survey by Transport Scotland found that most women feel forced to adapt their own behavior to prevent potential assaults on public transportation. This becomes especially precarious on night trains, where overnight travel typically involves some form of sleep, hence the senses are depressed; communal spaces are dark and quiet and staff is not within easy reach [60]. In fact, most shared sleeper or berth cars offer female- only compartments.

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The permanent presence of staff in well-signposted compartments increases the perception of safety. The safety of the vehicle itself is not usually considered a concern. While many people suffer from fear of flying, few experience this type of feeling on trains. They are perceived as the safest mode of transportation [61] and are in fact the choice of preference among those anxious about flying. However, safety on stations is an issue for passengers of night trains leaving late or arriving early when most shops and offices are (still) closed. Some companies have dedicated waiting rooms at stations, while in others, they are well lit, even guarded waiting rooms. In bigger stations, companies offer lounges for first class passengers or those belonging to a certain category of loyalty programs. Table 3 indicates the strengths, weaknesses, opportunities, and threats of night trains from the perspective of their specific social impact, focusing on travel time, comfort and safety. In all three metrics, advantages and disadvantages break even. Quality and duration of travel time seem to have a positive impact during the journey itself, but not in its preparation. Comfort and safety seem to strongly rely on the personal perception of travelers, which means that train companies need to invest in educating the public in the expected social norms on trans as well as enhance their feelings of comfort and safety to attract the still hesitant members of the public. This is especially important regarding vulnerable groups, such as women, elderly, people with disabilities or minorities.

Table 3: SWOT analysis of the social aspects of the sustainability of night trains.

Strengths	Weaknesses
Travel time Night trains save hours of daytimetravel, as most travel time is spent asleep. Departure and arrival times, if well selected, allow for efficient use of timeat destination **Comfort** Night trains are prepared for night travel. Night trains cater for different travelers' needs and profiles. **Safety** Trains are perceived as safe.	**Travel time** Some passengers consider total travel time as a metric, regardless of how it is spent Scheduling and sales are published a short time in advance. Frequency of service is not guaranteed in the long run. **Comfort** Not all travelers relax and rest on anight train. **Safety** Certain groups (e.g., women) may feelunsafe travelling at night.
Opportunities	**Threats**
Travel time When compared to other modes of travel, time spent by train is perceivedas quality time? **Comfort** Passengers tend to have positivefeelings about train travel. **Safety** Presence of permanent staff on trains enhances feeling of safety	**Travel time** High-speed rail and flights offer muchshorter travel times. Short-term sale of tickets sendspassengers to other modes. **Comfort** Comfort standards evolve and requireredesigning and refurbishing rolling stock **Safety** Safety onboard cannot be guaranteed100%

Discussion

High-speed and not night trains are seen as the standard alternative to air travel [22]. However, high-speed rail has a considerable higher impact in emissions, habitat fragmentation and energy use than conventional rail [62], thus night trains as they are today. The idea of creating high-speed night trains as a useful alternative, the so-called Very Long- Distance Night Trains (VLDNT), seem not to have caught ground yet [63]. However, the data from the results suggests that the use of night trains in Europe will have an overall positive benefit on sustainability. While night trains may suffer potential drawbacks from the economic challenges, the practical impact they have on sustainability outweigh the disadvantages. The emissions data and eco-audit analysis for night trains show that they should be the most preferred option from the points of view of energy use and emissions, compared to automobiles and airplanes. This is very promising, as the goal of the European Union is to push towards an environmentally conscious transportation system as soon as possible. Revitalizing the night train industry provides a sense of

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hope that it is possible to achieve carbon neutrality by 2050. Based on the SWOT analysis, one opportunity to make night trains even more sustainable is to use renewable sources of energy to fuel the journeys. All train companies in Europe should adopt similar policies to discontinue the use of non-renewable energy sources to power their trains and look to alternative green fuel sources to further improve sustainability efforts in the transportation sector. Although trains, alongside motor vehicles, have a very high need for infrastructure necessary to facilitate mobility, there are potential solutions to mitigate these effects. As discussed previously, rail infrastructure causes habitat fragmentation, as the mere existence of the tracks leads to a division of local ecosystems. It is noted that, in comparison to high-speed trains, night trains, (which travel at a much lower velocity) have a lower wildlife collision rate. Also, the construction of fauna over- and underpasses is a potential solution to allow animals to cross tracks and prevent them from getting stuck between or under the rails. Another potential solution to dissuade the interest from animals is the use of olfactory repellents, usually applied to the rails [15].

From the economic point of view, there are many options to consider making the prices of night trains more economical for consumers and still ensuring the train companies can operate successful businesses. Because of the large contrast in government policies for the air and rail industry, airlines can take full advantage of the subsidies and various exemptions on fuel taxes, while train companies are suffering because of the lack of economic support from the government. To level the playing field for air travel and rail travel, government funding should shift to the rail industry, as this form of transportation is far more sustainable than air travel. In fact, one option is to slowly increase the price of aviation by first removing the 0% VAT and taxing kerosene [2]. Also, the externalities of the different modes should be accounted for. Because of the high impact that air travel has on the climate, it would be favorable to at least tax the non-renewable fuel that is being used. Another recommendation for the European Union is to set a 0% VAT on all international rail routes, as well as reducing the TAC fees, even if it is only on a temporary basis (SNCF lowered its TAC for freight during the COVID-19 pandemic, as reported by the specialized portal Railtech). An EU- wide exemption on TAC for seven years would be very beneficial to rail companies and will help them have a successful business model as they are reintroducing night train travel. If these two changes are enacted, ticket prices can be lowered by an average of 15% [2]. If the playing field is levelled, it would be much more sustainable to utilize rail transport for these shorter distances, including night trains, for journeys that are 800 to 1,200 km long. The EU Fit for 55 Package, presented in 2021, perhaps comes to aid this. It intends to align economic incentives with climate, social and environmental objectives, while recognizing differences in the global and competitive context under which different modes of transport operate [5].

One of the most relevant bottlenecks for night trains is the availability of rolling stock. Although most long-distance cross-border night services envisioned by various organizations (notably Back-on- Track Europe and Oui au Train de Nuit) are feasible, there is a need to support the availability of rolling stock for them. A coordinated effort and financial (public) support for "the creation of pools of long-distance cross-border rolling stock, or to the mitigation of commercial risks for leasing companies when acquiring and leasing out long-distance cross-border rolling stock, could help generating the desired boost" [5]. Technical and operational hindrances for cross-border night train include differences in electrification systems can be dealt with by multi-system locomotives and trains, but there is a limit to the number of different systems that can be accommodated within one engine or fixed-formation train set, thus needs to be looked at carefully. Differences in track and structure gauge can be managed with stock with gauge-changing equipment, such as those (that were) widely used in the Spanish and Ukrainian borders [64]. Other aspects that would help the feasibility of night trains is the standardization of safety protocols, a continent-wide certification system of train drivers, and harmonized train crew training [5], to enhance worker's mobility and flexibility in hiring staff. The Single European Railway Area (SERA) planned in the Fourth Railway Package should contribute to achieving these goals [48,65].

Another problem that affects the customer volume for night trains is ease-of-access for booking the tickets. Currently, it is more difficult to book train tickets, especially international, because there is not a streamlined website for continental train travel. Consumers must use multiple sites from different train companies to figure out the logistics of their journey. Some of these websites are not very easy to navigate either, or do not feature in multiple languages. It is not clear what rights assist passengers in the case of rerouting, cancellations or missed connections, as each company has its own policy [64,66]. It should also be possible to book well in advance, months or even a year, much like what airlines offer. Some authors even suggest the integration of different modes of transportation in single booking platform(s), where passengers can combine air, train, and bus tickets to their convenience [66-68]. To make this process more accessible to customers, one recommendation is to create a universal continental travel search engine, so the booking process becomes less of an inconvenience. This would help the sleeper train industry by strengthening the customer demand and be more aligned with the easy booking process of the aviation industry. As said above, the quality of time as a decision factor also includes schedules, frequency, punctuality, and reliability. Getting to and from the station as well and waiting time at stations is perceived as a nuisance. Since it is a subjective perception, it can be reduced subjectively. While connectivity with stations is generally well solved and amenities are offered in place (food, shops and even entertainment), hauling luggage may limit access to these services. Short term lockers are

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a useful solution to this problem. Waiting at platforms can also be perceived negatively, especially in through stations and at night, so well-lit waiting shelters with vending machines can be helpful, even better if staff can be found nearby.

Once aboard, in the case of night trains, both the departure and arrival times need to be considered. Most attractive are train departure times between 19:00 and 23:00, with arrival times between 7:00 and 9:00 the next day (within these timeframes, the time loss is considered less for night trains than for flights) [64]. This range, which includes a few stops in the late evening and early morning but preferably none during the night, to avoid disruptions by boarding/deboarding fellow passengers, should allow for a decent rest. During the journey, the concept of worthwhile travel time (WWT) in long distance travel applies especially well to trains, as they appear to offer the most potential for enabling a high-quality use of travel time, even if that involves sleeping [69]. Another key concern among travelers is arrival time. Weighing this against the possibility to take a cheap red-eye flight, flying the night before, or early in the morning, makes it difficult to convince passengers to take night trains. Key in this respect is the opportunity to "lie in" on arriving night trains or "board early" on the return services, for which they should arrive and depart at main stations and stay at the platform for a significant length of time. This may be difficult due to lack of parking capacity at stations and commuter train congestion around them, especially in the morning peak hours, one of the main traffic bottlenecks of night trains [31]. In fact, many such services are diverted to secondary through stations, which lack the necessary facilities for waiting, eating, washing, and resting. The train arrives and departs with just enough time to (de-)board it and passengers then merge with the flow of commuters, who in turn do not appreciate being stuck with luggage-hauling passengers at stairs and escalators.

Improving communications between different rail lines, as stated earlier, could improve ease-of- access for people looking to take night trains. Also, the frequency should be daily, so that passengers have freedom to choose travel dates without needing to find alternatives for trainless days. Punctuality and reliability are a must if night trains are to be seen as a viable option, especially for business travelers. By improving accuracy in all these aspects, train companies can ensure that customers look to take night trains more regularly. To date, because of the limited number of journeys by train compared to the numerous options by air, missing a connection has a much larger impact, and can result in customers unwilling to travel by rail. There is abundant anecdotal evidence of travelers in the blogosphere "celebrating" delays, detours, and cancellations, as if these were part of the charm of train travel (pers. obs.). Companies understand this is not their target audience and aim at the public at large, who usually simply want to get to their destination in time. The European Union must therefore collaborate with train companies to provide users with an easier and more comfortable way to manage bookings to revitalize the night train industry [5,64].

In terms of physical comfort, researching more compact ways to house overnight passengers could improve customer satisfaction while still maintaining the economic overhead necessary to keep night trains operating. "Rail companies need to make the customer their priority - and improve the overall travel experience." [67]. Because night trains have a smaller carrying capacity by design, it is necessary to analyze ways to maximize passenger occupancy without sacrificing comfort. While night trains in the 20th century had three basic and universally recognizable levels of comfort, today, operators prioritize differentiation not only in classes but invest in signature design. Designing both for comfort and to allow catering for different needs and preferences has become a must [70]. An example of this can be seen in the individual sleeping pods offered by ÖBB, which offer a high level of privacy with the comfort (and price) level of a berth. Companies must convince customers that the potential discomfort of traveling for such a long time is outweighed by the amenities that night trains can provide, such as complimentary breakfast or toiletries. Comfort is not only related to the amenities onboard, but also to the journey itself. A study found that for sleeping comfort and quality, "vibration, vehicle speed/movement, and noise levels on sleep should be balanced, and abrupt changes of some factors, e.g. jerk or distinctive sounds should be avoided. Thus, not only cabin design but track quality and driving style should be considered too" [71]. Also, temperature, smells, lighting in common areas and other sensory inputs should be controlled to ensure a positive experience among passengers [72] It is evident that they are more likely to use night trains if they perceive a higher comfort level in comparison to airplanes and automobiles. This perceived comfort level is a combination of safety, physical comfort, matching types of accommodations, etc. Safety is a concern among many travelers, especially those belonging to vulnerable groups (women, elderly, children, people with disabilities), as well as first-time travelers or people with travel anxiety in general. As night trains currently operate, they worry about feeling unsafe while traveling. This fear is compounded by the lack of secure spaces to store luggage as well as inefficient accommodation. A potential solution to this issue is having places to check baggage, as the aviation industry does. Including locked luggage storage encourages overnight travelers to take night trains for connections that are long distance. The implementation of specific cars for these groups, such as a female-only car to prevent targeted attacks, or adapted compartments for wheelchair users, is also an option that is already in use.

Conclusion

Night trains have significant potential to become a leading mode of transportation in Europe and let the label of niche market go for good. They are an excellent choice for environmental sustainability, as they are the most environmentally friendly option out of all the major transport modes. Specifically, regarding

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carbon emissions and the EU's Green Deal initiative to be carbon neutral by 2050, the revitalization of night trains as a major component in the transportation industry will make this goal even more attainable. Night trains, unlike their comparable competitor in the high-speed rail industry, provide a higher ecological benefit, with lower emissions and measures in place to avoid impacts such as habitat fragmentation or noise. Running on existing lines makes the impact of the infrastructure negligible, except for a somewhat heightened risk of collision with nocturnal wildlife.

The weakest aspect of night trains is their cost. Lack of rolling stock, high operating costs due to TAC and VAT, as well as inconsistent pricing and booking policies, make them much less competitive than other forms of transportation. Solutions to these issues include reduced TAC for night trains, VAT exemptions where it is still applied and an improvement of booking systems. Rolling stock availability may improve with the standardization of night train features, renting and leasing cars and refurbishing existing ones. From the social point of view, time spent on trains is gradually perceived as quality time, but preparing the journey well in advance is still a challenge. Comfort and safety are subjective metrics that are perceived differently by passengers. Good information and awareness raising by train companies and even public authorities may convince those who are still in doubt. Implementation of ways to reduce these issues and highlighting the many positive values they have, can return night trains to a more prominent role as a reliable, commercial, and more eco-friendly method of transportation. Even with their weaknesses and challenges, night trains prove to be a sustainable mode of transportation, adequate as a level alternative to high-speed rail and airplanes for medium and long distances.

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