The Rationale of Policies Promoting the Use of Railway to Passengers (in Particular Young People) Contributing to the Sustainability of the Mobility Sector: A Comparative Study of the European Union and China

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Abstract

Governmental policies drive change by framing plans addressing issues such as climate change; despite concerned with similar problems, policies from different contexts vary in approaches e.g. regarding sustainable development. Therefore, this study conducts a comparative policy analysis between the European Union (EU) and China. Concretely, the aim is developing similarities and differences of policies regarding a sustainabable mobility sector as it contributes highly to carbon emissions. Explicitly, policies promoting using the railway (RW) system towards passengers – particularly young passengers – as sustainable transportation option, are analysed by three aspects: issues, goals and tools. The results show in European and Chinese policies this topic is categorised into five main arguments: carbon emissions, utilisation and optimisation of the RW system, connectivity of people, passenger numbers and needs, and young passengers. Overall, there are similarities in both policy contexts regarding these overarching topics, but the specifics differ immensely. The EU organises overcoming national borders for a coherent RW network and increased connectivity; China plans including more regions for similar reasons. While the EU struggles with low passenger numbers, China projects enhanced orderly and safe RW service on immense passenger flow days, to only name some differences which have potential to complement each other.

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1. Introduction

The climate crisis is an undebatable catastrophe with risks of many kinds. Without surprise these risks do not make a halt before the human mobility which has been growing consistently in the last decades due to the phenomenon of globalisation. Consequently, the transportation sector is already and will be increasingly affected by phenomena such as destruction of infrastructure due to natural disasters like storms, floods, rising sea levels, heat stress and wildfires (Carlin & Arshad, 2024). Within the transportation sector the most polluting modes are road, shipping and aviation (Carlin & Arshad, 2024). However, the transportation by railway (RW) has a significantly lower level of emissions which is due to several reason. As a consequence, this depicts an immense potential as research has shown that the RW system presents an important contribution to sustainable transport mode options for passengers and freight especially for medium distance routes (Ruiz-Mora et al., 2024). Moreover, high-speed RW systems have the potential of decreasing the consumption of non-renewable resources and carbon emissions in a country and therefore boost sustainable development in the mobility sector (Shen et al., 2023). Besides that, there are numerous spheres in which the RW system has potential expand sustainable development such as energy usage, low environmental noise, design of vehicles and tracks, operation and maintenance (Ezsias et al., 2023).

In particular, in this study the focus will lay on the RW transportation of passengers. More specifically, its contribution towards and potential in sustainable development of the mobility sector and how this is reflected by governmental policies currently in place. Furthermore, the attention of this study is put on the interplay between the RW travel behaviour of passengers and public policies concentrated on increasing the use of RW transportation. Particularly, relevant to this research, are the aspects which policy makers have identified regarding the importance of the specific branch of the mobility sector: RW passenger transportation. Therefore, concrete obstacles to be overcome have been defined, in combination with goals to work

towards and tools to help achieve the desired goals in order to promote the use of the sustainable transportation option of RW to all. In order to make this research study more concrete the policy analysis additionally concentrates on initiatives directed towards young RW passengers. 'Young' is used here in the sense of adults who recently turned 18 years old or the more diverse group of university students.

In order to explore various degrees of governmental engagement in increasing the use of RW for travelling, a comparative policy analysis of two socio-political contexts is conducted. Therefore, policies and initiatives by the European Union (EU) and the Chinese government are inspected, these governmental public policies were established to increase sustainability in the mobility of people through RW use and in particular to give young people incentives to travel by RW. On one side, EU policies such as the Action Plan on Boosting Long-distance and Cross-border passenger rail from December 14, 2021 and the Creating a Green and Efficient Trans-European Transport Network also from December 14, 2021 were predominantly used for the analysis. On the other side, the Chinese Green Travel Action Plan from May 20, 2019 and the Implementation Plan for Promoting Low-Carbon Development in the Railway Industry from February 2024 predominate the contribution to the policy analysis.

This comparison is functional as the territorial range for the RW systems to be covered of the EU and China is of similar size and in respect to each region carbon emission levels are in comparable ranges, since both contexts are under global top four polluters (Paddison & Choi, 2024). Furthermore, both the EU and China established a sustainability plan for the mobility sector with parts centralised around the RW system and as a further step there are initiatives in both contexts to promote RW use for passengers and particularly young people. Moreover, comparing two diverse sociocultural and political contexts with each other on a public policy level, effectively brings together either matching or varying governmental approaches to corresponding challenges in one research study (Zhang, 2024).

Bringing all these aspects together in one study has the potential to address a specific gap in the current literature. There has been research on the motivation of people for choosing RW as transport mode separately in both the EU and China. However, policies concerning sustainable passenger transport through RW have not been analysed through the lens of promoting train travel for passengers. Further, comparing policies of the EU with Chinese regarding this topic has not been done before. Therefore, the research question to be answered is: *What are the similarities and differences in policies promoting railway travelling among passengers (in particular young people) contributing to the sustainability of the mobility sector between the EU and China?*

The structure of this research paper is as follows: first of all, there will be a case description in order to facilitate a context specific introduction. Then, the methodology for the process of data collection will be elaborated. Subsequently, a theoretical background is given in connection with the establishment of an analytical framework for the work with the policies. This is followed by the findings of this research. This result section is structured in three parts oriented by the analytical aspects: policy issues, the goals to be achieved and the respective measures implemented. Each of these sections consists of three subsections, one about the similarities between the polices from both contexts and then two on the differences one for EU-specific policy aspects and one for the Chinese ones. Finally, there will be a section on some discussions and conclusions.

2. Case Description

2.1. Railway Systems of the European Union and China

In general, the establishment of a RW system and high-speed RW networks in particular have a crucial potential to connect agglomeration regions culturally and economically (Cheng et al., 2015). Especially, western-central Europe – including France, Germany, Italy and Spain – has a significant high-speed RW network which is a crucial competition to short distance flights and was used as an inspiration for the Chinese high-speed RW system in the early 2000s (Ruiz-Mora et al., 2024; Shen et al., 2023). Due to the sustainability aspect of RW travel in comparison to other transport modes, the RW system and its sustainable development is highly supported by European policies even if there is still immense competition with other transportation modes like aviation (Ruiz-Mora et al., 2024). In the case of Europe as a zone including multiple countries, factors like less border controls and standardising regulations like ticketing have a highly significant impact on increasing international passenger mobility patterns (Cheng et al., 2015).

In China, there is also a significant competition between air transport and high-speed RW, which can be traced back to multiple factors. Over time historically, the RW system first lost its relevance when air transportation was introduced, but from the moment of the establishment of a well-developed high-speed RW system, trains gained in importance as a true competition for air transport (Shi et al., 2020). China's high-speed RW system is one of the world's youngest, but fastest-growing and nowadays biggest RW networks with 40,000 kilometres of coverage connecting most of its cities with each other (Shen et al., 2023). It is used for daily commuting (Li et al., 2024) but also for national tourism (Shi et al., 2020) and also long-distance travels for homecomings on public holidays (Xijia & Yiyi, 2025) by all generations and diverse social groups.

In general, it is most important for an effective RW system spreading over a significant land mass to increase accessibility in agglomeration regions, but also an implementation of a regular and coherent time schedule (Cheng et al., 2015). This has proven to increase efficiency over diverse distances in both cases of China and Europe (Cheng et al., 2015). Furthermore, an increased number of high-speed RW has the potential to take pressure off of other transport modes especially in peak hours or around high usage times such as around Christmas or the Chinese Spring Festival (Pan, 2021).

2.2. Railway Passengers' Travel Habits

Reasons for choosing travelling by RW heavily vary from individual situations, but have general (cultural) trends (Shi et al., 2020). Nevertheless, there are overlaps in tendencies of passengers from both analysed contexts. In Europe specifically, three main factors were found to influence people choosing their transport mode, namely travel time, travel cost and overall comfort (Witlox et al., 2022). Long-distance international travel passengers further value differences regarding transfer times, costs and convenience between transportation modes higher than in regional traffic (Witlox et al., 2022). Although RW tickets for international travels are often not significantly more expensive than for example air transportation, RW tends to be chosen less, which can be connected to the inconsistent rules, regulations and ticketing systems between European countries as they effect the process of purchasing tickets (Witlox et al., 2022). However, European travellers decide rather against RW travels due to a higher level of convenience with car or air transportation due to the current infrastructure, although the expenses might be higher (Witlox et al., 2022). Moreover, the reasons for choosing the RW system differ between European countries not only based on local availability and personal preference but because of cultural preferences (Ruiz-Mora et al., 2024).

In China, similarly to European passengers' cost and benefit tendencies, the high-speed RW system in comparison to the air transport tries to increase social convenience. There is

evidence that the Chinese high-speed RW system – rather than only focusing on its own profits comparable with the air transport market – has higher social convenience as a key goal which is reflected for instance in the ticket prices being relatively user-friendly (Shi et al., 2020). The price of tickets is one of the most significant factors for passengers when making decisions towards different transportation modes. Additionally, the efficiency, punctuality, comfort and safety of the RW system are essential factors for passengers to choose this transport mode in China (Shi et al., 2020). Overall, in the Chinese population socio-demographic characteristics have a significant influence on passengers choosing their travel mode and studies have shown that young people are the most likely among social groups to choose buses or trains (Pan, 2021).

2.3. Young Passengers' Travel Habits

In general, there are multiple reasons for the importance of looking at this particular passenger group of young people, for instance some "[research r]esults show that the majority of Generation Z are willing to hop on to greener transport for our planet and urge public authorities to invest in sustainable rail transport." (Ruiz-Mora et al., 2024, p. 82). Besides, young people represent "a key role in shaping consumer demand, and in acting as an agent of change" (Jordan et al., 2020, p. 12). Additionally, there are findings of young travellers bringing advantages for the respective travel destinations, one reason for this is that young people perceive travelling as a crucial part of their lives for development rather than merely a short escape of their daily lives (Jordan et al., 2020).

More specifically, in the European context young people and university students take up a special place as passengers because they have the potential to shape the RW system, and this role has been increasing in recent years due to the progressing of the climate crisis (Shi et al., 2020). Furthermore, young European people are willing to switch to more sustainable transportation modes such as the RW in the name of confining global warming. This is specifically true under aspects of being able to purchase RW tickets for a low price and having a time

efficient travel (Ruiz-Mora et al., 2024). Travelling by RW has become increasingly important for young people in Europe over the last couple of years, not only to get from place A to B, but also to learn about new places and as an essential tool to discover new cultures and places (Ruiz-Mora et al., 2024).

Furthermore, Chinese university students bring special characteristics to the table for choosing the RW as travel mode which differ from other social groups, such as “low-income but less economic pressures, flexible schedule, and openness to new things.” (Pan, 2021, p. 37). Additionally, Chinese students were more likely to choose trains considering factors like the amount of time available for travelling, the duration of transfer times, the travel companions and the financial support for travel expenses by their parents (Shi et al., 2020). Moreover, Chinese students often present the biggest group of passengers especially in times of homecoming for nationally or regionally important events like the Chinese Spring Festival, as students tend to leave their hometowns to study in different cities (Pan, 2021). Most importantly for Chinese university students in order to choose the RW system to travel with, is the discount on railway transportation which is part of a subsidy policy by the government (Shi et al., 2020).

3. Theoretical Background and Analytical Framework

This section places the research study into the heretofore existing literature and identifies the structure of how the policy analysis has been conducted. Firstly, for the theoretical background the original multi-level perspective model is briefly explained and why it is suitable as the theoretical foundation of this work is outlined. Afterwards an adjusted version of this model is put forward creating the theoretical groundwork of this research. In addition to this the analytical framework of how the policy analysis was done is illustrated.

The multi-level perspective model was extensively studied by Frank W. Geels whose work once already connected it to the transportation system (2012). Overall, this model

concerns itself with societal transitions and the influence on those by new technological innovations, so called niche innovations (Geels, 2004). More specifically, it places sustainable transition as an important part of societal development. Rather than focusing on only one specific aspect – what effects technical advancements have on people – the multi-level perspective model is concerned with socio-technical regimes. One of those regimes includes multiple systems like markets with user preferences, the industry, science, policies, culture and technology (Geels, 2011). Within the transition process, the multi-level perspective model shows that niche innovations influence the socio-technical regime. In the long run the changes within the regime caused by niche innovations have the potential to affect the socio-technical landscapes. This landscape embodies the overall contextual factors influencing for instance all regions and countries in a similar way, such as climate change agreements.

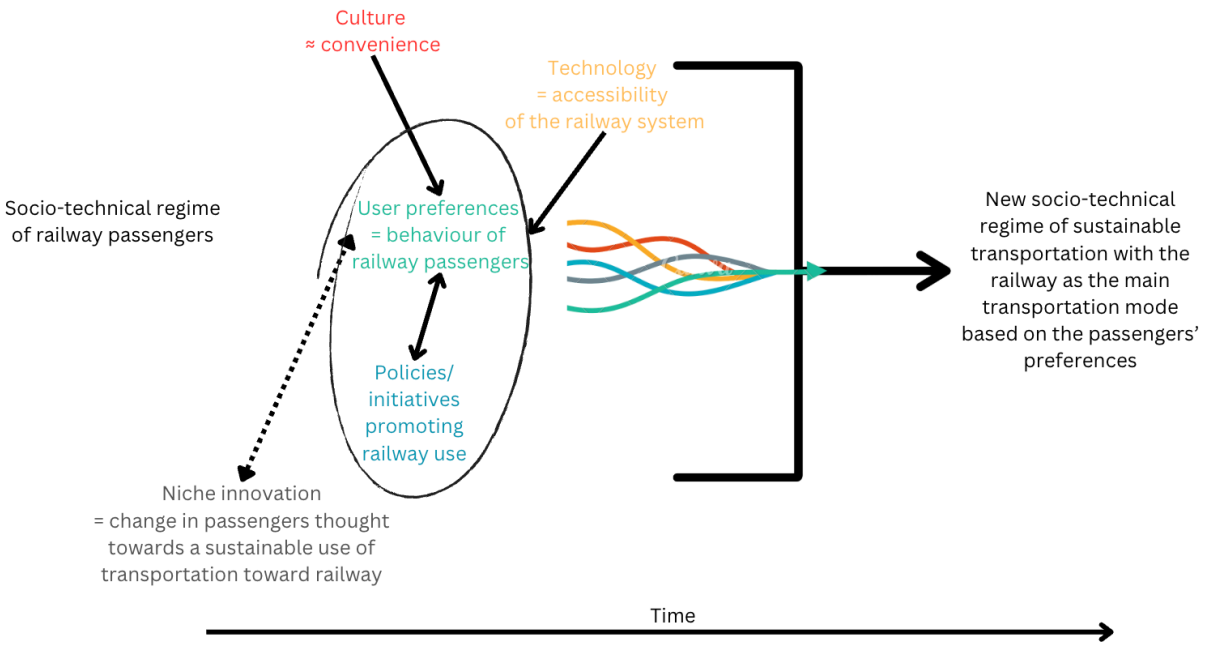
The main reason for using the multi-level perspective model is that it is connected to sustainable transitions and it involves multiple dimensions of societies like social, economic, technical, political developments and their interplay (Geels, 2011). However, the complex structure of the multi-level perspective model does not fit the frame of this research, as covering all relevant aspects would make the analysis for each aspect incomplete. Therefore, an adapted version of the model was created to focus specifically on mobility patterns of RW passengers and how the interplay of these patterns with related policies unfolds. Furthermore, there are other regimes within this specific socio-technical regime such as culture and technology which are relevant for the wider reality-context (refer to *Figure 1*).

This new model specifies the focus on transitions in general by the original multi-level perspective model, concentrating it more specifically on the interplay of the RW passenger behaviour with policies aimed towards influencing passengers' behaviour, consequently this makes the new model less complex. Precisely, the socio-technical regime of RW passengers includes the systems of user preferences, policies, culture and technology. Particularly, the user

preference depicts the behaviour of RW passengers, the policies include initiatives promoting the use of the RW system and policies addressing goals of sustainable development within the RW transport sector. Further, the culture regime is connected to social factors and conveniences influencing RW passengers' habits, and technology refers to the accessibility of the RW system which influences RW mobility patterns. The interplay between these regimes creates the socio-technical regime of RW passengers and sustainable transition which has an effect on the whole socio-technical regime (refer to coloured arrows in *Figure 1*). Therefore, this depicts the main focus of this study: the connection between 'behaviour of RW passengers' and public policies. Nevertheless, the additional factors mentioned here as well are important for the bigger picture of the socio-technical regime. Finally, the analysis of the effects the socio-technical regime has on the socio-technical landscapes extends the frame if this research.

Figure 1

Theoretical Framework of Placing Study in Literature: The Interplay of Passenger Behaviour and Policies in the Sustainable Transition of the Mobility Sector



Note. Made by author on the basis of Geels' model

In order to investigate effectively this relation between RW passengers' mobility patterns and policies promoting the use of sustainable transportation, a concise analytical framework was created for evaluating the relevant policies thoroughly (refer to *Figure 2*). Generally, each policy analysis is based on a different structure because the focus is put on other key features within the policy or policies in consideration. This analysis is organised around three main aspects – reflected in the structure of the results section – which are interrelated and influence each other within each policy: the problems, the goals and the tools (refer to *Figure 2*). In addition to identifying each of these aspects in the European and Chinese policies separately the findings are compared to each other through the lens of noteworthy similarities and differences. Therefore, each of these three sections in the results chapter have three subsections, one for the similarities in policies between EU and China and then one on each policy context with content that differs from the other. Further, in each subsection there will be some discourse included, about for example the reality situation after the implementation of the respective policy, on the specific part of the policy for a more critical perspective of the analysis.

Firstly, all policies are examined in order to find what policy makers have determined in their respective context as outstanding problem or issue of the current situation with the necessity of being addressed. Particularly, this is a crucial part of governmental policies as they are meant to have a positive impact on acute issues and future development. Overall, the definition of policy problems varies in the level of concreteness including a spectrum from broad overarching situations to specific small-scale issues. In addition to that it is of relevance for this analysis what the motive of policy makers behind addressing the established problems is and how this can be evaluated. Further, this motivation can be described as how the policy makers perceive the problem in question and why this issue is essential to be addressed within the respective policy.

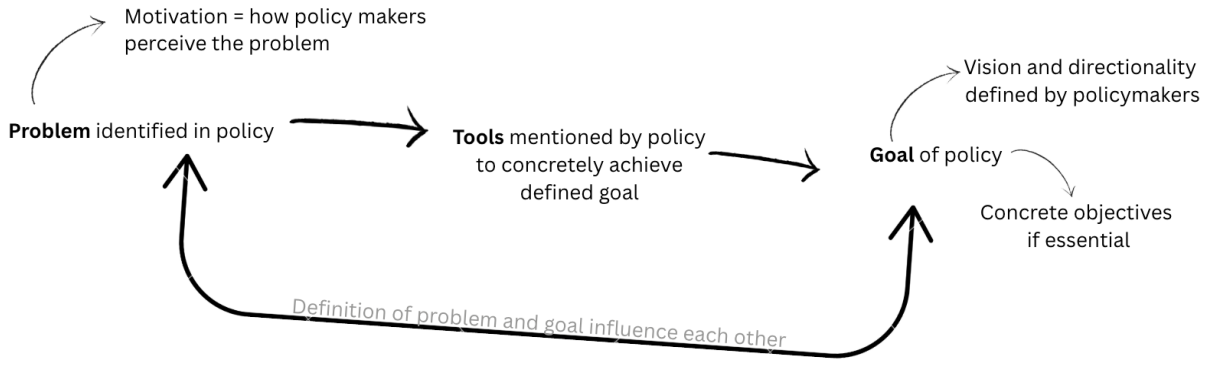
Secondly, the goals designed to be achieved by the policies in order to overcome the aforementioned relevant issue are studied. This part of policies is crucial for providing an accurate perspective of how the future is envisioned to be after overcoming the issue. In addition, the policy goals included the visions and the directionality intended by the policy makers which is of relevance for the analysis. Moreover, some overarching policy goals are supported by concrete objectives in order to specify the meaning.

Thirdly, the policy tools and measures by the EU and China are outlined. Fundamentally, these tools have been created to help address the policy issues and reach the desirable goals. More concretely, the policy measures are essential for the policies to become incentives for change and development in reality as intended.

Furthermore, the analysis takes into account the special relation between policy issues and goals (refer to *Figure 2*). This is done because these two parts of every policy are influencing each other significantly in a way that they are shaped to fit together to make the policy coherent and therefore more effective. Moreover, in this relationship the policy tools function as a bridge between the issue and the goal to complement both definitions (refer to *Figure 2*).

Figure 2

Analytical Framework of Policies Promoting Railway Use in the Name of Sustainability in the Mobility Sector



Note. Made by author

4. Methodology

This research project is structured on the basis of qualitative research in order to fill the above-mentioned research gap. Appropriate academic research studies were found using Google Scholar as a search engine with diverse searching prompts like ‘young people’s influence on railway system transition’; ‘train system comparison China vs EU’; ‘multi-level perspective transition train system’; ‘interrail young people behaviour Europe’. Additionally, more references were found by scanning bibliographies of relevant papers.

Moreover, this public policy analysis is a generic one to describe, explain and evaluate the key features of the relevant policies. Particularly, the focus of this policy analysis lays in a comparison of two policy contexts: the EU and China. There are multiple reasons for conducting a comparative policy analysis, above all stands the focus on working out similarities between the two vastly different policy contexts. In the literature, the comparison of policies has been a central challenge as this kind of methodical research tool often is of interdisciplinary nature (De Wee, 2021). Consequently, in the field of policy analysis comparing and contrasting two policy contexts is not commonly adapted (De Wee, 2021). However, the act of going beyond a single, national policy field on an international level can provide space for extending policy progress in a domestic frame (Steiner-Khamsi & Morais de Sa e Silva, 2024). As a result, it is possible to identify insights for the broader theoretical context of policy establishment with a comparative policy analysis (De Wee, 2021). Fundamentally, this comparison will bring attention towards reoccurring governmental issues, measures, objectives and long-term goals while taking both respective socio-political and economic contexts into account (Zhang, 2024).

In particular, all governmental policies used for this research were chosen on the basis of being connected to the topic of promoting RW transportation for passengers in the name of sustainability. If this specific topic was not sufficient enough the search for policies was broadened to plans by the EU and China to make the mobility of people and therefore the

transportation sector more sustainable with focus on the RW system. More specifically, it is important to mention that at the time of conducting this research in either context there has not been one single policy merely focusing on promoting the use of the RW system among passengers for more sustainable mobility. Hence, numerous policies had to be gathered within the broad topic of sustainable transportation through the RW system and/or creating incentives for passengers to use RW.

Concretely, the biggest contributions among specific policies were the Action Plan on Boosting Long-distance and Cross-border passenger rail from December 14, 2021 and the Creating a Green and Efficient Trans-European Transport Network also from December 14, 2021 on the European side (*Table 1*). China brought forward the Green Travel Action Plan from May 20, 2019 and the Implementation Plan for Promoting Low-Carbon Development in the Railway Industry from February 2024 (*Table 2*). Furthermore, to include a more specific focus in this study incentives to promote RW travelling among young passengers were taken into account as well. Namely, the policies around DiscoverEU were included in the analysis as well as the Chinese discount system for university students for trips to their homes.

Lastly, it is important to mention in this section that for the Chinese policies there was a language barrier which had to be overcome in two key aspects of the research. One in the search for the right policies as well as during the analysis of the content of the policies. The search for suitable policies was supported by the supervisor of this research project. In the process of working with the policy texts the translation tool of the search engine Safari was used from ‘Chinese (Simplified)’ to ‘English’.

Table 1

Relevant EU policies

Policy Name + *Date*	**Most Relevant Chapters**	**Link**
Fact Sheets on the European Union: Tail transport	Most Policies were found through this Fact Sheets	Fact Sheet Rail transport
1) Directive 2012/34/EU *from November 12, 2012*	Establishing a single European RW area	Directive 2012/34/EU
2) Directive (EU) 2016/2370 *from December 14, 2016*	Opening the market for domestic passenger transport services by rail and the governance of the RW infrastructure	Directive (EU) 2016/2370
3) Action Plan on Boosting Long-distance and Cross-border passenger rail *from December 14, 2021*	Whole News Article	Action Plan on boosting long-distance and cross-border passenger rail
4) - New transport proposals target greater efficiency and more sustainable travel - Creating a Green and Efficient Trans-European Transport Network *from December 14, 2021*	- Whole News Article - Factsheet	- New transport proposals target greater efficiency and more sustainable - Efficient & Green Mobility
5) Regulation 2021/782 on rail passengers' rights and obligations *from April 29, 2021*		Regulation 2021/782 on rail passengers' rights and obligations
6) Sustainable and Smart Mobility Strategy – putting European transport on track for the future: {SWD(2020) 331 final} *from December 9, 2020*	- Our Vision: 6. - Sustainable Mobility – an irreversible shift to zero-emission mobility: 11 - Flagship 3 – Making interurban and urban mobility more sustainable and healthier: 31.-34.; 36.-37. - Flagship 5 – Pricing carbon and providing better incentives for users: 52. - Smart Mobility – Achieving seamless, safe and efficient connectivity: 54.-55. - Flagship 6 – Making connected and automated multimodal mobility a reality: 59. - Flagship 9 – Making mobility fair and just for all: 88./92.	Communication of the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions
7) A fundamental transport transformation: Commission presents its plan for green, smart and affordable mobility *from July 20, 2021*		- A fundamental transport transformation - Sustainable and Smart Mobility Strategy

Policy Name + *Date*	**Most Relevant Chapters**	**Link**
8) Rail transport: passengers to enjoy better protection and smoother travel experience *from June 7, 2023*	Whole News Article	Directorate-General for Mobility and Transport
9) Transforming rail: More convenient and sustainable train travel in the EU *from July 17, 2024*	Whole News Article	Directorate-General for Communication
10) What is DiscoverEU		What is DiscoverEU
11) More about DiscoverEU	- Quota - Funding	More about DiscoverEU
12) Study on Generation Z Travellers *from July 2020*	1.2. Why young travellers matter	European Travel Commission

Table 2

Relevant Chinese Policies

Policy Name + *Date*	**Most Relevant Chapter**	**Link**
1) Notice of the Ministry of Transport and other twelve departments and units on the issuance of the Green Travel Action Plan (2019-2022) *from May 20, 2019*	Article 16 about raising passenger's awareness and changing passengers' behaviour	Website of Ministry of Transport
2) The railway department has taken multiple measures to ensure the travel of students and passengers *from August 28, 2023*		National Railway Administration
3) Implementation Plan for Promoting Low-Carbon Development in the Railway Industry *from February 2024*		National Railway Administration of China
4) Student discount information		12306 China Railway
5) As low as 1 yuan! 12306: Implement preferential ticket prices according to the passenger flow	Whole News Article	The Paper

5. Results

The following section presents the findings of the comparative policy analysis for this research. The results are orderly providing as an overview of the identified aspects of the two context specific policies with their similarities and differences in a categorised manner (refer to *Table* 3). More specifically, within each of the key aspects – problem, goal, tools – the concrete examples, which will be examined and worked out, are hierarchically organised from most fundamental and overarching concepts to concrete, context specific ideas. Each section engages with the five established reoccurring aspects, namely first carbon emissions, second utilisation and operation of the RW system, third the connectivity of people through the RW network, fourth concerns about passenger numbers and their needs, finally – only mentioned by the policies under the aspect of problems and tools not goals – young passengers' circumstances.

5.1. Policy Issues

5.1.1. Similarities of Policy Issues Between the European Union and China

In regards to the issues which were mentioned in the analysed policies from both contexts, five of these problems stood out the most as being similarly formulated by the EU and China. More specifically, they are concerned with emissions, utilisation, connectivity, passenger numbers and young passengers' situation in the RW system. Each of these policy issues are deeply intertwined with each other and build on one another.

Firstly, in both contexts there is a concern about the level of pollution by the mobility sector. This is the most fundamental and general issue in regards to the mobility of people. Since, both policy contexts have acknowledged that the current passenger transport branch is generating a number of emissions that is too high. In the eye of mitigating climate change this level of emissions is seen as urgent problem by the European and Chinese policy makers to be addressed at the current state. Consequently, there are policy plans surrounding the topic of

sustainable development of the RW system. This includes on one hand to increase the use of RW as it is a greener transportation mode option in comparison to other options such as air transportation and on the other hand there are ideas to make the RW transport itself more sustainable.

The second issue defined by the policy makers is relatively low utilisation of the RW system by passengers. In connection with this, the fact of the RW not being the most attractive travel option for passengers at the moment, is brought up and framed as a policy problem to be addressed. This relates to what was mentioned above that the RW system is a comparatively sustainable transport option and therefore the low usage rate is an important factor to be considered when reaching for a green future of the mobility sector as increasing use of RW has the potential to decrease transportation related emissions overall.

Thirdly, there are noteworthy obstacles to the connectivity of people. Connectivity can generally be defined as "the state of being connected" and in relation to people it is the degree to which for instance people in one country are connected to each other by infrastructure such as roads or range of the RW system (Hornby, 2020, p. 324). This aspect of connectivity in regards to the mobility of people was mentioned as concern by policy makers in both respective contexts. As both in the EU and China connectivity is among other things challenged by the lack of extended RW system to all regions in the areas of interest. Most affected by this are populated regions in rural and remote areas which often are not included in the coherent RW network. Furthermore, increasing the connectivity of people positively impacts the utilisation of the RW system as more people have the possibility to access the RW network which then again can be related to decreasing emissions of the transportation sector.

The fourth aspect of this analysis, is that both policy contexts stated to face challenges regarding passenger numbers. An increase in these numbers can be related to connectivity as its rise also enlarges the number of people using the RW system. However, there are more

specific characteristics of this obstacle of passenger numbers which differ immensely between the EU and China and therefore is examined in detail in the next sections.

Finally, both global players established policies with specific conditions for young passengers. This can be related to multiple reasonings, one is the lack of utilisation of the RW system. In order to include young passengers in this effectively policy makers from each context have acknowledged the unique position of young people. Specifically, young passengers are often constrained in decision making regarding travel mode options due to their financial budget. Additionally, young people are generally often overlooked in policy making.

5.1.2. Policy Issues of the European Union

First and foremost, due to the uniqueness of the concept behind the EU, there have been noteworthy barriers for the RW system identified. These challenges fundamentally differ from China as the Chinese RW system is operating in one country's territory range. Most outstanding in regards to this difference is the challenge of overcoming national borders within the EU. This is essential as it results in multiple RW regulatory systems. Consequently, these borders and varying RW systems are restraining the connectivity of people and disturbing the passenger flow across the whole region. Moreover, there are trends of European passengers – especially for cross-border travels – to choose other transportation modes over the RW which lowers the utilisation of the RW system overall and could be caused by the difficulties behind the multiple regulation systems.

Furthermore, the issue of numerous regulatory systems is reflected in for instance various ticketing operating systems. This has consequences affecting passengers negatively, as it makes on one hand the purchase of tickets highly inconvenient for cross-border travels. On the other hand, there is little cooperation between these ticketing operators which brings new challenges to passengers for instance in situations where they technically are entitled to compensations due to delays during international travels (Witlox et al., 2022). This inconsistency of

passenger rights results in lacking protection of the travellers Europe-wide, which can result in decisions against RW as the passengers' travel mode of choice.

Another persisting issue put forward by EU policies is the level of digitalisation and technological development within the European RW system, as it is not in the desirable state of modernisation and its evolution is dragging on. Digitalisation is mostly related to online ticketing and use of online data about for instance passenger flow preferences which are not shared between national operators, but could contribute to more efficient development of RW schedules (Witlox et al., 2022). Technological development includes the lack of sufficient cross-border RW traffic especially regarding high-speed RW for international connections. Both of these aspects are highly influenced by the existence of multiple regulatory systems.

In terms of the above-mentioned issue of passenger numbers, the European RW system is struggling with a deficient number of passengers. It is clear for policy makers that this lays in numerous reasons, which pose issues to be addressed by policies themselves. These reasons can be traced back to most problems mentioned above such as the varying ticketing systems, the lack of digitalisation and international RW connections, but also the incomplete protection of passenger rights.

Moreover, the unique motivation of why the EU provides incentives for young people to use the RW system is noteworthy. In its essence this incentive is also connected to the issue of unsatisfactory passenger numbers in general. This policy motivation lies behind the idea of giving an incentive for young people to explore Europe by RW. More specifically, this initiative is called DiscoverEU and it is oriented towards providing European young people the opportunity to connect and find new opportunities in other cultures and places. Consequently, the question comes up of why this is important to European policy makers. It may be due to the fact that although the EU wants to overcome the individual country boarders in some aspects

such as a coherent RW network, in another instance there are efforts to value the diversity of people and cultures with the DiscoverEU programme.

5.1.3. Policy Issues of China

Outstanding in contrast to policy issues by the EU, Chinese policy makers put focus on the fact that green transportation is still not sufficiently enough promoted among passengers. This lack of advertisement towards RW, as an important sustainable transport mode, has consequences on the RW travel behaviour of people. If travellers are better informed about the sustainable potential of using the RW system, their choices might be changed towards prioritising the use of RW.

The main reason identified by policy makers for the RW system in the Chinese context not being the most attractive transport mode yet, is the lack of convenience for passengers. This can be traced back to the challenge of making travelling by RW during peak travel days of a higher level of order, e.g. organising the masses of passengers on stations. Particularly, this includes concerns about compromised safety and unsatisfactory service quality for all passengers.

Challenges of connectivity unfold in different ways as the Chinese RW operator has only one national region to cover with its network. Nevertheless, the concern about connectivity is of importance as the RW system does not yet connect all regions. Especially, rural areas have up until now not been the focus of extending the RW network to the respective regions which now represents an issue to be addressed in public policy.

Furthermore, the Chinese concern regarding passenger numbers is fundamentally different in comparison to the European one. It is of outstanding relevance for the Chinese policies regarding the RW to focus on the immense capacity stretches during peak travel days due to public holidays such as the Spring Festival or the summer holidays of universities. This again relates to the issue of order and safety for all passengers that the Chinese RW operator wants

to put high priority on. Overall, this contrary issue of passenger numbers can be traced back to for instance the fact of China having a higher population number than the EU region.

Lastly, attention has to be brought to the motivation of incentivising the use of RW among young people for China's policies. Since, students often face financial distress due to the restricted budget at their disposal as well as expenses of travelling home for the holidays, policies have been established to decrease in particular this pressure with train ticket discounts specifically for university students. This can be connected to the above-mentioned plan of advertising the RW system in regards to green transportation options, as this initiative promotes the use of RW among not only the general public but also young people.

5.2. Policy Goals

5.2.1. Similarities of the Policy Goals Between the European Union and China

First of all, the most overarching goal for both policy contexts is to reduce carbon emissions related to transportation. This is aimed to be achieved by multiple defined goals such as optimising the RW system overall, effective promotion of low-carbon travel means and optimising the connectivity of people. Fundamentally, these three aspects ideally have the consequence of increasing the amount of regular RW passengers.

The policy goal of optimising the RW system is especially concerned about improving the operation in the name of reducing emissions for more sustainability. In particular, the EU and China have concretely aimed with this towards the end goal of reaching a significantly reduced carbon emission level by directly improving the operation of the RW system itself. In addition, the energy consumption of the RW sector is to be permanently decrease to a substantially low degree. Furthermore, with this the green travel transportation is also planned to be truly advertised positively towards all people which aims to increase the use of the RW system significantly in the long run. This includes the advertisement of RW use with the reasoning of more green and sustainable mobility to address climate change.

Hand in hand with the optimisation of the RW system goes the goal of inherently enhancing the connectivity of people in the respective operation regions with the help of the RW system. For this the optimisation of the operation system needs to reach the goal of connecting all populated areas with each other in an appropriate manner, with for instance coherent and consistent RW traffic schedules. Consequently, more people are able to become regular RW transportation passengers.

Overarching for EU and China's policy goals is also to address and fulfil all passengers' needs adequately to their situation. In both contexts this is reflected with differing concrete objectives of specific passengers' needs. Inherently this is connected to the operational system of RWs in regards to passenger service rather than technical operation. In addition, the fulfilment of all passengers' needs ideally increases the regular use of RW for transportation. However, either of the policies by the economic powers have defined a specific goal in their agenda to be worked towards for young passengers and addressing their concrete needs.

5.2.2. Policies Goals of the European Union

The optimisation of RW operation is mainly focused on the reduction of transport-related emissions in the European context. However, the European policy makers aim that this enhancement of improved operation in the name of sustainability is also promoting the use of this sustainable transportation options. As a well-connected and efficient RW network makes the utilisation of it for passengers more attractive.

More specifically, the EU wants to maximise sustainable mobility overall on one hand with the increase in use of RW and on the other hand by enhancing low-carbon emission operation of the RW system itself with four main objectives. Firstly, the vision is to direct efforts towards a high quality RW network with high-speed trains not only for long distances but more so as well on short-haul routes. Secondly, this increase of high-speed rail supply is concretely defined as doubling the amount of train traffic by 2030 and tripling it by 2050. Thirdly, the

seven per cent of kilometres covered by cross-border travels through RW at the current point is to be significantly enlarged as a policy objective. Lastly, a 90 per cent cut in emissions is to be achieved by 2050 with the establishment of a smart, competitive, safely accessible and affordable RW transport system for all, which is also part of the European Green Deal with concrete climate goals. With all of these plans the European policy makers envision to create a sustainable RW system through optimising it on multiple ends.

Furthermore, as the issue of connectivity across the EU is well defined as shown above, the goal is to drastically increase it by making RW the first choice for passengers. Nevertheless, this can only be achieved with the development of the current RW network in general. Therefore, the EU explicitly defined a goal for a single European RW area called the Trans-European Transport Network. This includes extending the RW system to places where it is not yet extensively built. There is one noteworthy concrete objective in regards to the plan of not only extending the RW network but also improving the existing infrastructure: drastically decreasing the travel time by RW between major European cities. One explicit example of this is the route between Copenhagen and Hamburg which to the present day takes four and a half hours, but with the improved technologies is aimed to only take two and a half hours.

Another crucial aspect of the European policy goals is concerned with the fulfilment of all passengers' needs. Fundamentally, this can only be achieved with the first step of opening the RW market to international competition. This was defined by EU policy makers with the idea of making RW operators increasingly responsive to passengers' needs. This plan goes hand in hand with the aim to improve the quality of RW operators' services and their cost-effectiveness overall. Furthermore, a crucial point to reach is the full protection of all passengers' rights over all European national RW operator regions. This is connected to cases where passengers are entitled to compensation due to delays, cancellations and missed connections during international RW traffic. Finally, the EU policies have made it to a necessity to be achieved within

the RW system that for passengers with special needs due to reduced mobility or disability all needs are fulfilled.

With all of these ambitious goals the question comes up about the effectiveness of these policies in reality. For this the EU Climate Action Progress Report 2024 is consulted. This type of report has been released every year since the establishment of the climate emission goals of the EU and covers achievements, new plans and ideas for implementations toward the goal of a greener and more competitive EU (European Commission, 2024). According to this report the transportation sector has continued to be one of the biggest barriers towards reducing carbon emissions (European Commission, 2024). More specifically, the report states numbers about the operation of the transportation branch such as that in 2023 the total emissions generated by this sector decreased by 0.8 per cent (European Commission, 2024). Despite the predominate focus on road transportation emissions by the report in most of the covered years, it is also mentioned that in July 2024 a new grant was provided to support the establishment of a greener, safer and smarter RW system under the Trans-European Transport Network project which could be seen as partial achievement in the direction of the final goal of a coherent RW network across the EU (European Commission, 2024).

5.2.3. Policies Goals of China

The plan of decreasing the carbon emissions in the Chinese policies has some specifics in addition to European goals. Overall, the reduction of pollution through RW transportation is also deeply connected to the optimisation of the RW system operation. For instance, an important focus is put on the promotion of the use of low-carbon producing equipment in the process of maintaining and extending the infrastructure of the RW system. The end goal for this is having all new constructions and all already existing RW infrastructure on a high-level regarding sustainability.

The optimal operation of the RW system is oriented towards a truly effective transportation structure. Overall, the Chinese policies stress the advertisement of green, low-carbon transportation in order for all people to know about the importance of sustainable transport and all the possible options. A specific objective in this category is the promotion to people who have to commute for work. This advertisement targets the information about public transportation options in relation to green travel opportunities likewise in regards to everyday commuting. Additionally, this promotion includes the education about carbon emission peaks and the desirable goal of carbon neutrality. In the long term the Chinese RW operator works towards supporting the comprehensive green transformation of transportation, but consequently also enhancing the development of the economy and society.

Furthermore, the objective of reaching an ideal level of connectivity among all people cannot be ignored. Concretely, the ambition is to have a RW network bridging the mobility of most people nation-wide. This is only possible to be achieved if the optimisation of RW operation has an extended network to all populated regions by going beyond the current connection of mainly dominant agglomeration areas.

Within the goal of improving the operation of the RW system in China the importance of addressing all needs of the passengers stands out with different concrete objectives than in the European plans. More concretely, the policy of the National Railway Administration of China includes the establishment of a permanently enhanced level of safety and ordered organisation of the RW operation in favour of its passengers. In terms of improvement of safety, a concrete objective has been formulated: the security checks for entering RW stations should be raised to a standardised level. This standardisation is implemented in accordance with the final goal of optimising the process of entering and exiting stations faster than before. In addition to the security checks, the identity inspection process is planned to be advanced in the name of enabling a higher level of safety during train travels to make passengers opt rather for travelling

by RW than for any other means of transportation. For the same reason there are additional efforts made in order to improve the guidance of passengers in the form of higher levels of service for more orderly travel by RW.

In the case of China, the goal of promoting green transport for everybody could be seen as more or less successful as there is evidence that the public opinion developed to be rather positive or neutral towards sustainable transportation options, especially on online platforms (Fu et al., 2025). Nevertheless, it has to be stressed that negative voices are still of relevance. More specifically, opposing views towards green transportation surround the topics – also covered in the policies analysed in this study – of "inadequate infrastructure, poor service management, and safety concerns." (Fu et al., 2025, p. 23). Therefore, it is clear that in both contexts the policies had an effect towards the reality and the defined policy goal, even if there are still noteworthy shortcomings towards the desired end goals.

5.3. Policy Tools

5.3.1. Similarities of the Policy Tools Between the European Union and China

The comparative policy analysis established that it is effectively impossible to implement one specific measure for the reduction of generated carbon emissions. Therefore, it is most essential in order to achieve carbon neutrality to work with the following tools simultaneously. Similarly to the other sections, in both, the EU and China, there are overarching ideas of tools to combat the above-mentioned issues which however in their concrete execution differ significantly.

Concrete plans of expanding the RW network to currently overlooked regions were established in the EU and China. This is deeply intertwined with two other crucial aforementioned objectives. On one side this can only be achieved by an optimisation of the RW network and on the other side the underlying effect is intended to be an increase in connectivity among people.

In relation with the goal of addressing all passengers goal one measure noted by both the EU and China is connected to ticketing. The concrete plan can be divided into two different objectives. One is making the process of acquiring and purchasing tickets more accessible to the majority of passengers. More specifically, this is directed towards the offer and service of online ticket sales. In addition, policy makers from both contexts find that the establishment of improved options to purchase multi-transport tickets has the potential of adding positively to the goal of making the RW system increasingly accessible. This can be categorised as a specific subtopic within the overarching goal of optimising the RW.

More specifically, towards the addressing of the issue of supporting the special position young people have as RW passengers, specific measures were established by the EU and China. Although the specifics in execution differ, overall, the best option for supporting young passengers were found to be the provision of special ticket offers. Broken down this results in the establishment of discount ticketing options for young passengers with the help of the respective policies.

5.3.2. Policies Tools of the European Union

A crucial priority for the European policy makers presents the creation of a coherent RW system, various policy tools are directed towards increasing the possibilities of travelling between multiple countries more conveniently to expand European connectivity. In order to achieve this, attention is directed towards prioritising the inclusion of rural areas and remote regions into the RW network efficiently in regards to integrate a higher number of passengers into the whole system along with consistent RW traffic schedules. Simultaneously, major European cities are being connected more significantly in order to address the issue of lacking connectivity. More specifically, focus is put towards decreasing travel times on specific RW routes, for instance by improving the currently existing infrastructure and adding high-speed RW routes and trains. In particular, a higher number of cross-border RW traffic is to be

established for this purpose. However, for this to happen coherently a change in the operators' regulations and administration areas has to be achieved. Additionally, a coordination of timetables and management capacities of national operators among each other needs to be accomplished.

In addition, there are concrete ideas on how to harmonise the ticketing service throughout the whole territory of the EU under the umbrella of optimising the operation in general with the end goal of making RW a more attractive transport mode option. The first step for this to happen is to adjust the legal framework of the EU regarding ticketing operators, to bring cooperation and coherence into the foreground of ticketing websites. Furthermore, this harmonising of the ticketing service is intended to go beyond the RW system with bringing multiple public transportation modes together in one system of overarching operators. Furthermore, there are also voices of policy makers who want to actively support passengers in finding the most lucrative connections and prices in a policy setting.

Zooming in again on the group of young passengers and the policy tools that are directed towards them, unfolds the specifics of the DiscoverEU plan. In particular, the programme is structured in the way that in each member state there is a specific quota of young 18-year-old adults who are able to apply for a free train ticket for a certain time period including free access to – mainly cultural – activities. The validity of such a ticket is restricted to one year and within this year the ticket holder has a certain number of travel days which can be used with any European RW operator and in arbitrary combination.

This leaves open the question about how effective these tools are in reality. Up until recently it can be said that the harmonisation of a European-wide RW operator system has not been as successful as the potential has been portrayed by the policies (Witlox et al., 2022). It is indisputable that change has occurred with for instance – rather regional – new operators such as one by the Deutsche Bahn called 'Arriva', which operates not only in Germany but also in

the Netherlands (Witlox et al., 2022). However, there is still an immense tendency of national operators being a higher priority to national governments than international cooperation of operators proposed and supported by the EU policies (Witlox et al., 2022). So, in the light of the fact that "[m]any international travellers still do not see the train as an attractive form of transport [and t]he opening of the [RW] market has apparently not given train operators enough incentive to meet the needs of international travellers" (Witlox et al., 2022, p. 10) it can be said that the current European policy tools should reconstructed in order to have a bigger impact. Nevertheless, there is change in sight with the newly announced extension of ticketing purchase availability for central European countries. Explicitly, in the context of the German RW operator that is concretely planning to make ticketing sales online – on their own website – for international RW travels possible for all German neighbouring countries – including Switzerland – from the end of 2026 onwards (ZDFheute, 2025). The foundation for this is the change in handling passenger flow data based on the change in EU legal framework.

5.3.3. Policies Tools of China

As China does not have to overcome multiple national borders the focus of an expansion of the RW network differs in that aspect of increasing connectivity within. Nevertheless, there are plans on boosting the RW system in linking urban clusters, metropolitan areas, raise the number of intercity connections and the inclusion of (sub)urban regions into the whole network. This is directed towards the goal of expanding the mobility of people to more regions. Additionally, policies focus on connecting the long-distance travel service with urban transportation with higher level of efficiency. Overall, the planning of round trips by train is intended to be made more accessible through a higher availability of these kinds of tickets.

Furthermore, there are concrete ideas of making the process of purchasing tickets more convenient. One aspect of this lays in relation with peak travel times and days, as the national RW operator plans to enhance ticket presale options online in order to prevent an overflow of

demand. For an improvement of service operation there will also be a provision of a restricted number of tickets to be sold onsite at RW stations. Moreover, there are measures of making multi-transport tickets which include the RW system and the online purchase of those tickets more accessible and widely spread. Additionally, there are measures towards making online identification mandatory for special tickets – like student discount tickets – easier in regards to increase the purchase of these tickets.

More specifically, Chinese policies also concentrate their tools towards passengers' discounts in order to generally make travelling by RW more attractive for everyone. This can be seen for instance in the fact that on peak days there is a market-based ticket pricing system for flexible discounts. In particular, there are additional discounts for university students for homecoming during university holidays. Concretely, every student at a higher education institution – with some restrictions – is entitled to a student ticket which covers four one-way RW tickets for each academic year. However, there are certain restriction about what this discount ticket provides, e.g. students are only able to purchase the most basic seat or sleep wagon option.

In China, the implementation of some of the tools mentioned above was perceived as quite helpful and convenient by passengers (Xijia & Yiyi, 2025). In particular, the increase of ticketing benefits with more connections to choose from and with the option to purchase tickets in presales, was highly appreciated by passengers in advance and during the peak travel days of the Spring Festival (Xijia & Yiyi, 2025). Additionally, enhanced student discount options positively supported university students for the travels back home by train with less inconvenience than in the years before (Xijia & Yiyi, 2025).

Table 3

Overview of Results

Aspect	**Similarities**	**Differences**	
-	-	**EU**	**China**
1. Problem from current standpoint	Passenger transport sector overly generating emissions (China: 3); EU: 7))		
	RW ≠ most attractive travel option	Restricting national rules, slow uptake of digitalisation, too little cross-border trains, insufficient passenger rights (EU: 3), 9), 8))	Not most convenient travel mode and aspect of green transportation not sufficient enough (1))
	Challenges to connectivity	Country borders	Insufficient RW network between all the regions
	Concerns with passenger numbers	Too little people use RW transport (EU: 4))	Too many passengers on peak days like public holidays, university summer holidays (China: 2))
2. Motivation for discounts for young passengers	Young passengers recognised as often low spenders with less financial budget (China: 4), 5); EU: 12))	Explore EU culture and new places sustainably to connect and find new opportunities (6))	Relieving students from economic/financial pressure while returning home (4); 5))
3. Tools	Establishment of coherent RW system to connect rural areas to urban areas (China: 1); EU: 6))	- Increasing cross border RW traffic & ticketing - Train options to all EU cities, regions & rural areas (4), 6))	- Increasing RW in urban clusters, metropolitan areas, intercity connections & (sub)urban areas (1))
	Making acquiring a ticket easier with main focus on online ticket sale and increase the possibilities of purchasing multi-transport tickets (China: 2), 1); EU: 6), 8))	- Europe wide ticketing system across transportation types & operators by transforming European legal framework (3), 5), 6)) - Supporting passengers to find best tickets for lowest price (4))	- Increase availability of online tickets like specific tickets (1)) - Optimising ticket purchase in peak times with pre-sales & sales at train stations (2)) - Simplifying online identification process for tickets
	Discounts for young people	Limited amount of 18-year-olds (quota per country chosen by lottery among the applicants) receiving free train ticket for specific travel time period plus discounts on other – mainly cultural – activities (EU: 10))	- Full-time university students, 4 one-way tickets for each academic year (4)) - Discounts for general population on peak days: market-based ticket pricing with flexible discounts (5))
4. Goal	Optimising the operation and connectivity of RW in the name of carbon reduction and green travel (China: 1), 3); EU: 1))	For a reduction of transport-related emissions (EU: 1))	For significantly improved green RW travel (China: 1))
	Promoting low-carbon, low energy consumption transportation to address climate change (China: 1); EU: 9))	- Make train travel top passenger choice - Make RW more sustainable, efficient, and well-connected across EU	- Promoting goals & tasks of carbon peaking/neutrality; promoting low-carbon transformation of equipment

Aspect	Similarities	Differences	
-	-	**EU**	**China**
			- Advancing green RW construction - Optimising & adjusting transportation structure - Advancing green operation & maintenance - Providing support for serving comprehensive green transformation & development of economy & society (3)
	Addressing all passengers' needs	- Opening rail markets to competition => making RW operators more responsive to customer needs - Improve quality of RW operators' services and their cost-effectiveness (6)) - Improve protection for passengers of delays, cancellations and missed connections. - Improve responds to needs of persons with disabilities or reduced mobility." (8))	- for safe transportation and to address all needs of passengers - "ensure the safe and orderly travel of the majority of students and passengers" - "make every effort to meet the travel needs of students and passengers." - "Strengthen service guidance." (China: 2))
6. Concrete objectives	Increase of sustainable RW transport	- Significantly increase the 7% of the kilometres of cross-border travels by trains (3)) - Doubling high-speed rail traffic by 2030 and tripling it by 2050 (3)) - High quality transport network with high-speed rail services on short-haul distances (6)) - 90% emissions cut by 2050, delivered with smart, competitive, safe accessible and affordable transport system (7))	
	Connectivity	- Single European Rail Area/ Trans-European Transport Network: "passengers will be able to travel between Copenhagen and Hamburg in 2.5 hours by train, instead of the 4.5 hours required today." (4))	
	Enhancement of security		Optimize entry & exit process, promote standardisation of security check & identity inspection processes for RW and improve the efficiency of entry & exit (1))
	Promoting green travel		"Promote the inclusion of public transportation and green travel in the universal welfare services of trade union members." (1))

6. Discussions and Conclusions

The increasing in enhancement of connectivity in both analysed contexts is of noteworthy significance. Reasons for this can be found in the fact that this automatically includes more people in the RW system of the respective region. Therefore, a higher number of people is able to contribute to the development of the whole frame of reference in regards to a future of more sustainable transportation.

In direct comparison of some aspects potentials for restructuring policies can be identified after the analysis. One example of this is that the EU could establish an extensive discount system for young RW passengers oriented on the case of China. This discount would be focused on supporting young people in their everyday life by relieving some financial pressures. In contrast to this, China could also orient their policies on the European example of DiscoverEU, particularly discounts for young people on cultural activities combined with travelling by RW. Ultimately, this could establish greater knowledge and long-term interest in including aspects of Chinese culture in everyday and work life through museum visits, sightseeing and experiencing regional cultures outside the university setting.

Moreover, it is important to mention that both the EU and China are still heavily reliant on less sustainable transport modes than the RW system such as road or air transportation, these additional transportation modes did however not fit the frame of this research. Nevertheless, in reality this is of high importance in regards to how much governmental resources can be put into the sustainable development of the RW system when simultaneously working on sustainability in other branches of the transportation sector. This had two effects toward the study. One is that because of relevant other transportation modes, policy makers cannot solely focus on the sustainable improvement of the RW system. A result of this is a lack of one single policy regarding sustainable RW in both contexts. Secondly, the real effect of the analysed policies is

hardly possible to be concisely considered as other policies on different parts of the mobility sector are excluded.

Overall, this research firstly presented literature about the sustainability aspect of RW transportation in the EU and China and how the travel habits of passengers in these respective contexts unfold. Additionally, a theoretical background was provided in order to place this research in the current literature of sustainable development and transition. In conclusion, there are five key takeaways of analysing similarities and differences in each policy aspect from both contexts: issues, goals and tools. Similarities between the EU and China were mainly identified in universally defined parts of these aspects and the key differences are connected to the specifics in execution of each plan.

More specifically, the first overarching topic is about the problematic high level of carbon emissions currently generated by the transport sector; therefore, the goal is to decrease them rapidly, in order to guarantee this, there are numerous measures initiated. Secondly, policy makers in both contexts are concerned about the degree of RW utilisation which is aimed to be increased by a coherent network and an optimisation of operation, in addition focus is put on the promotion of use of RW as sustainable transport option. The third topic is the connectivity of people, currently the issue is the low level of it, which is also defined to be raised significantly by the optimisation of the RW operation. Fourthly, European and Chinese policies voiced concerns about passenger numbers, which are to be addressed by enhancing the realisation of essential passengers' needs. Finally, the special position of young RW passengers and travellers is taken into account in the policy issues of the EU and China and picked up again in the policy measures section to support this position with concrete tools.

Furthermore, it is important to stress that in both contexts all mentioned policy goals should be worked towards simultaneously. This is due to the close connection between certain goals and the specific definitions as presented in the sections 5.2. and 5.3.. For instance, the goal of

reducing carbon emissions and carbon neutrality is defined to be targeted by optimising the operation of the RW system overall. For future research it can be interesting to look into the actual effects on the current situation of the policies in both contexts. This stands in connections with questions whether there is a positive impact on sustainability by these policies or how improvements could be made to address the issues more effectively.

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8. Appendix

Table 4

Detailed Excerpt of EU Policies

Policy Name	Problem	Tools/Measures	Goal
1)			"The aim is to achieve the optimal use of railway tracks and increase punctuality and reliability, which will help to reduce transport-related emissions. On 12 March 2024, Parliament adopted its position at first reading. Interinstitutional negotiation will start in the next legislative term once the Council adopts its position on the proposal."
2)	"was adopted (…) as regards the opening of the market for domestic passenger transport services by rail and the governance of the railway infrastructure."		
3)	"Commissioner for Transport Adina **Vălean** said: *'Rail is one of the most sustainable modes of transport we have. And yet, this potential risks going to waste – cross-border trips account for just 7% of the kilometres travelled by train. This Action Plan will help us make rail a more attractive option for long and cross-border journeys. We have identified the main barriers, from redundant national rules to complicated ticketing and the slow uptake of digital technologies. Today we are*	- "accelerating digitalisation; removing redundant national technical and operational rules; (…) bringing railway staff training and certification in line with future needs; modernising passenger rail infrastructure; more efficient use of the rail network; (…) more user-friendly ticketing and access to the rail system; (…) making sustainable transport modes and attractive option for young people." - "These new measures come on top of the existing EU regulatory and policy framework for rail, which equipes Member States and the sector with many tools to implement the Single European Rail Area, to remove barriers and to open the market for new players and services." - "measures to improve connections between airports and railways"	- "boost long-distance and cross-border passenger rail services" - "Trans-European Transport Network (TEN-T) to increase high-speed rail capacity" "In December 2021, the Commission adopted an … The aim is to improve rail infrastructure and increase high-speed rail capacity and investment support for rail in order to achieve the EU's objective of doubling high-speed rail traffic by 2030 and tripling it by 2050." - "contribution to the European Green Deal goal of making the EU climate-neutral by 2050"

	setting out how to take down these barriers, with passengers being the real winners.'"	- "activities have put rail in the spotlight across the continent, encouraging its use by both citizens and businesses"	
4)	- "Although the number of people travelling by train has increased in recent years, only 7% of rail kilometres travelled between 2001 and 2018 involved cross-border trips."	- "By increasing connectivity and shifting more passengers and freight to rail and inland waterways, by supporting the roll-out of charging points, alternative refuelling infrastructure, and new digital technologies, by placing a stronger focus on sustainable urban mobility, and by making it easier to choose different transport options in an efficient multimodal transport system, the proposals will put the transport sector on track to cutting its emissions by 90%." - "boost user-friendly multimodal ticketing; allowing passengers to find the best tickets at the most attractive price and better supporting passengers faced with disruption, and a commitment to investigating an EU-wide VAT exemption for train tickets; the repeal of redundant national technical and operational rules; (…) timetabling and capacity management, which will boost quicker and more frequent cross-border rail services; (…) more attractive ticket prices for passengers."	- "make travel in the EU more efficient – and safer – for drivers, passengers and businesses alike." - TEN-T: "passengers will be able to travel between Copenhagen and Hamburg in 2.5 hours by train, instead of the 4.5 hours required today." - "Cohesion: Connect Eu cities and regions, including rural areas and remote regions; Efficiency: Remove bottlenecks and gaps on transport network; Increase user benefits: Better transport services to citizens and freight customers"
5)		- "Infrastructure managers and railway undertakings will now have to **provide real-time dynamic traffic and travel information**, not only to railway undertakings, but also to ticket vendors and tour operators. By increasing access to railway undertakings' reservation systems, new rules will also enable vendors and operators to prepare more innovative offers, such as bundled tickets covering different carriers, and a combination of connections not offered until now." - (https://transport.ec.europa.eu/news-events/news/rail-transport-passengers-enjoy-better-protection-and-smoother-travel-experience-2023-06-07_en)	
6)		- 52: " This is why the Commission plans to establish a European framework for the harmonised measurement of transport and logistics greenhouse gas emissions, based on global standards, which could then be used to provide businesses and end-users with an estimate of the carbon footprint of their choices, and increase the demand from	- 11: "This implies that all policy levers must be pulled: (1) measures to significantly reduce the current dependence on fossil fuels (by replacing existing fleets with low- and zero-emission vehicles and boosting the use of renewable and low-carbon fuels); (2) decisive action to shift more activity towards more sustainable transport modes (notably increasing the number of passengers

		end-users and consumers for opting for more sustainable transport and mobility solutions, while avoiding green-washing. Information on the carbon footprint of a specific journey could become a new passenger right and in this case should apply to all transport modes." - 31: "Investment should be geared towards upgrading the necessary TEN-T infrastructure to enable the shift towards more sustainable links. Action will be taken to build an overall transport system where EU investments, State aid, rules for capacity allocation and public service obligations (PSOs) are geared towards fulfilling mobility needs and incentivising different multimodal options." - 33: "In 2021, the Commission will propose an action plan to boost long-distance and cross-border passenger rail services. This plan will build on efforts by Member States to make key connections between cities faster by better-managed capacity, coordinated timetabling, pools for rolling stock and targeted infrastructure improvements to boost new train services including at night. Platforms or other organisational structures for this purpose should be open to all Member States." - 34: "Commission will propose regulatory measures to enable innovative and flexible tickets that combine various transport modes and give passengers true options for door-to-door travel."	travelling by rail and commuting by public transport and active modes, as well as shifting a substantial amount of freight onto rail, inland waterways, and short sea shipping); and (3) internalisation of external costs (by implementing the 'polluter pays' and 'user pays' principles, in particular through carbon pricing and infrastructure charging mechanisms)." - 34: "Single European Rail Area (…) Cross-border tickets should become easier to use and to buy." - 54: "People should enjoy a seamless multimodal experience throughout their journey, through a set of sustainable mobility choices, increasingly driven by digitalisation and automation. As innovation will shape the mobility of passengers and freight of the future, the right framework and enablers should be in place to facilitate this transition that can make the transport system much more efficient and sustainable." - 55: "Public and social acceptance is key for a successful transition, which is why European values, ethical standards, equality, data protection and privacy rules, among others, will be fully respected and at the heart of these efforts, and cybersecurity will be treated with high priority." - 59: "Planning and purchasing tickets for multimodal journeys is cumbersome, as a conducive framework for EU-wide, integrated, multimodal information, ticketing and payment services is lacking. Addressing this will involve overcoming the insufficient availability and accessibility of data, sub-optimal cooperation between suppliers and vendors, the absence of digital tickets in some cases, inadequate payment system interoperability, and the existence of different licencing and distribution agreements. The EU needs to transform its legal framework to support multimodal travel information, booking and ticketing services, while at the same time looking at the rights and obligations of online intermediaries and multimodal digital service providers selling ticketing and/or mobility services."

			- 88: “The economic shock has highlighted the need for affordable, accessible and fair mobility for passengers and other users of transport services. Indeed, whereas the single market in transport has increased connectivity, mobility remains expensive for people with low disposable income, and not sufficiently accessible for people with disabilities or reduced mobility, and those with low IT-literacy. In rural, peripheral and remote areas, including the outermost regions and islands, improved public transport links will be essential to guarantee unhindered access to mobility for all.” - 92: “EU passenger rights should be better implemented, clearer for both carriers and passengers, offer adequate assistance, reimbursement, possibly compensation when disruptions arise, and appropriate sanctions if the rules are not properly applied. The Commission will consider options and benefits to go further with a multimodal framework for passenger rights that is simplified, more consistent and harmonised.” - 32: “With the implementation of the Fourth Railway Package and through the opening of rail markets to competition, railway operators will become more responsive to customer needs, and improve the quality of their services and their cost-effectiveness. Harmonised EU-wide vehicle approval will also reduce costs for cross-border trains. Completing the TEN-T, including the high-speed lines, will provide better connections along the main corridors. Improving passengers’ awareness about their rights and ensuring non-discriminatory provision of travel information, including through-ticket offers, will further boost the rail attractiveness for customers.” - 6: “Greening mobility must be the new licence for the transport sector to grow. Mobility in Europe should be based on an efficient and interconnected multimodal transport system, for both passengers and freight, enhanced by an affordable high-speed rail network, by abundant recharging and refuelling infrastructure for zero-emission vehicles [3] and supply of renewable and low-carbon

			fuels, by cleaner and more active mobility in greener cities that contribute to the good health and wellbeing of their citizens." - 31: "Europe should build a high quality transport network with high-speed rail services on short-haul distances" - 37: "The EU and Member States must deliver on our citizens' expectations of cleaner air, less noise and congestion, and eliminating fatalities on our city streets. (…) European policies and financial support should also reflect the importance of urban mobility for the overall functioning of the TEN-T,"
7)	- Our Vision 3: "By far, the most serious challenge facing the transport sector is to significantly reduce its emissions and become more sustainable."	- Sustainable Mobility – An Irreversible Shift to Zero-Emission Mobility 11: "all policy levers must be pulled: (1) measures to significantly reduce the current dependence on fossil fuels (by replacing existing fleets with low- and zero-emission vehicles and boosting the use of renewable and low-carbon fuels); (2) decisive action to shift more activity towards more sustainable transport modes (notably increasing the number of passengers travelling by rail and commuting by public transport and active modes, as well as shifting a substantial amount of freight onto rail, inland waterways, and short sea shipping); and (3) internalisation of external costs (by implementing the 'polluter pays' and 'user pays' principles, in particular through carbon pricing and infrastructure charging mechanisms)." - 32: "Improving passengers' awareness about their rights and ensuring non-discriminatory provision of travel information, including through-ticket offers, will further boost the rail attractiveness for customers."	- "the result will be a 90% cut in emissions by 2050, delivered by a smart, competitive, safe accessible and affordable transport system." - Our Vision 3: "At the same time, this transformation offers great opportunities for better quality of life, and for European industry across the value chains to modernise, create high-quality jobs, develop new products and services, strengthen competitiveness and pursue global leadership as other markets are moving fats towards zero-emission mobility. Giving its high proportion of total EU greenhouse gas emissions, the EU's goal of at least -55% greenhouse gas reduction target by 2030 and of climate neutrality by 2050 will be reached, only by introducing more ambitious policies to reduce transport's reliance on fossil fuels without delay and in synergy with zero pollution efforts." - Our Vision 8: "This evolution should leave nobody behind: it is crucial that mobility is available and affordable for all, that rural and remote regions are better connected, accessible for persons with reduced mobility and persons with disabilities, and that the sector offers good social conditions, reskilling opportunities and provides attractive jobs."
8)		- "As of now, passengers are better protected if their travel is disrupted, and railway companies must ensure a trouble-free travel experience for passengers with reduced mobility. An obligation for rail companies to share real-time traffic and travel data also paves the way for more competitive ticket offers."	- "Commissioner for Mobility and Transport Adina **Vălean** said: '*This new set of passenger rights is a key step on our way to better connecting people across Europe – and in a sustainable way. We need strong and modern rail passenger rights to attract more people to rail and contribute to our climate goals. The new rules will improve protection for rail passengers*

		- "Infrastructure managers and railway undertakings will now have to **provide real-time dynamic traffic and travel information**, not only to railway undertakings, but also to ticket vendors and tour operators. By increasing access to railway undertakings' reservation systems, new rules will also enable vendors and operators to prepare more innovative offers, such as bundled tickets covering different carriers, and a combination of connections not offered until now."	*faced with delays, cancellations and missed connections. They also respond better to the needs of persons with disabilities or reduced mobility.'"*
9)	- too many obstacles, little interoperability, outdated passenger rail infrastructure, and inconsistent quality of services across EU countries	- "Travelling by train in Europe is becoming more convenient and sustainable thanks to recent EU initiatives. New regulations for the **trans-European transport network** (TEN-T) to improve rail connectivity and make travel greener have recently entered into force. This means **better** and **more efficient rail services across Europe**." - "10 pilot projects to boost cross-border rail services" - "Young travellers can particularly benefit from the **DiscoverEU** programme, which regularly offers **free travel passes to 18-year-olds to explore Europe by train**. This programme encourages cultural exchange and highlights the environmental advantages of rail travel. The next call for applications should be published in autumn 2024." - "The EU is committed to making train travel a top choice by improving regulations, creating ambitious plans, and supporting special programmes. These efforts aim to make rail travel more sustainable, efficient, and well-connected across Europe."	- increase cross-border travel through improving cross-border rail connections across the Eu and make travel faster, easier and more affordable
10)	"As selected (young) travellers, you will receive a DiscoverEU European Youth Card for a wealth of discounts on cultural visits, learning activities, sports, local transportation, accommodation, and food. (…) If you are selected, you can travel for a period of minimum 1 day and up to 30	- Funding by the Erasmus+ programme - There is a quota (in relation to the countries inhabitants numbers) of available tickets for each participating state including non-full EU member states like Turkey	"Offers you the opportunity to explore Europe's diversity, learn about its cultural heritage and history, and connect with people from all over the continent"

	days between 1 July (of the selection year) and 30 September (of the year after the selection).”		
11)		- Funding by the Erasmus+ programme - There is a quota (in relation to the countries inhabitants numbers) of available tickets for each participating state including non-full EU member states like Turkey - Erasmus+ organisation/management: European Commission (executive body) …Managing budget, Setting priorities, Identifying the programme’s targets and criteria, Monitoring and guiding the implementation, Follow-up and evaluation of the programme, Studies and research	- “offers you the opportunity to explore Europe’s diversity, learn about its cultural heritage and history, and connect with people from all over the continent” - “opportunity to explore Europe’s diversity, learn about its cultural heritage and history, and connect with people from all over the continent.” - “Erasmus+: Enriching lives, opening minds”
12)	- “Assumed to be low spenders, the youngest cohorts of global travellers are often overlooked by desti- nation authorities and tourism suppliers.”	- “key role in shaping consumer demand, and in acting as an agent of change in destinations” - “young people have increasingly perceived travel as an essential element of their life and not just a brief escape from reality” - “Young travellers are likely to return and giver more value to the destination over time and the pioneers who discover new destinations and are the cutting edge of using new technology and gain cultural benefits from their travel and contribute to the places they visit” - “Gen Z is likely to play a key role in triggering innovation in destinations and tourism industry development”	

Table 5

Detailed Excerpt of Chinese Policies

Policy Name	Problem	Tools/Measures	Goal
1)		General: - "Build a large-capacity fast passenger transportation system in urban clusters and metropolitan areas by using high-speed railways, intercity railways, urban (suburban) railways" - "Improve the passenger transportation product system, innovate passenger transportation products such as air-rail intermod transportation and public-rail intermod transportation, and realize the organic connection and complementarity of various modes of transportation." - "Optimize the entry and exit process, promote the standardization of security check and identity inspection processes for railway and long-distance passenger passengers, and improve the efficiency of entry and exit." - "Promote the implementation of passenger intermode transport. Strengthen and improve the construction and management of comprehensive passenger hubs connecting civil aviation airports, railways, road passenger transportation, shipping and urban public transportation. Accelerate the integrated planning, synchronous construction, coordinated operation and coordinated management of the comprehensive passenger hub, and guide and promote three-dimensional transfer and same-table transfer. Strengthen the matching connection between urban public transportation and civil aviation, railway passenger transportation and other operating time. Encourage enterprises to provide ticketing services such as passenger connection and round trip, and accelerate the implementation of	- "earnestly promote the development of green travel, adhere to the priority development of public transportation, strive to build a friendly environment for green travel, increase the attractiveness of green travel, enhance the public's awareness of green travel, and further improve the level of urban green travel." - "The green travel environment will be significantly improved, the quality of public transportation services will be significantly improved, the main position in public travel will be basically established, and the level of green travel equipment will be significantly improved. The people will choose the sense of identity, gain and happiness of green travel continues to be strengthened."

		passenger connection transportation electronic tickets." Behaviour: - "Actively advocate giving priority to green travel for official travel. Promote the inclusion of public transportation and green travel in the universal welfare services of trade union members. Produce and release green travel public service advertisements, promote and spread the positive energy of green travel, make low-carbon transportation a fashion, and make green travel a habit."	
2)	- "6.8 million student passengers, and 950,000 are expected to be sent on peak days" - situation of student passengers travelling on some/same routes - "The railway department grasps the symmetrical characteristics of the summer round-trip of students' passenger flow. By analysing the data of students leaving school and returning to their hometowns, scientifically measuring the demand for returning to school tickets…"	- "The railway department carefully organises the transportation of students and passengers, coordinates the arrangement of capacity and travel services…" - "the railway department will study and judge the changes in the trend of student passenger flow in advance, increase the number of temporary passenger trains in the popular directions in time arrange the reconnected operation of multiple units, and the general-speed train to add trailer carriages, improve the passenger transportation capacity of students..." - "China Railway Urumqi Bureau Group Co., Ltd. plans to add 36 student special trains to Beijing, Shanghai and other directions, and China Railway Chengdu Bureau Group Co., Ltd. organizes a student special train to Shanghai Tongji University. Optimize the ticketing organization." - "optimising the ticketing organisation strategy in a targeted manner, and timely putting the ticket amount into stations with large student passenger flow demand, so as to enhance the ability to guarantee the number of students' tickets." - "China Railway Harbin, Shenyang, Beijing, Zhengzhou, Kunming and Nanning Bureau Group Co., Ltd. took the initiative to connect with education departments and major colleges and universities, timely grasped the opening time of relevant	- "ensure the safe and orderly travel of the majority of students and passengers" - "make every effort to meet the travel needs of students and passengers." - "Strengthen service guidance."

		colleges and universities and student transportation needs, dynamically monitored the pre-sale of student tickets, continuously optimized the ticket allocation plan, and maximized the ticket purchase needs of students and passengers." - online and offline verification methods for student tickets	
3)			- "we will earnestly implement the green and low-carbon plan in the transportation sector, solidly carry out various tasks in the railway sector to address climate change and reduce energy consumption and emissions, actively and steadily promote the goals of carbon peaking and carbon neutrality in the railway sector, accelerate the promotion of green and low-carbon development in the railway industry" - "We will earnestly implement the decisions and deployments of the Central Committee of the Party and the State Council, actively and steadily promote the goals and tasks of carbon peaking and carbon neutrality, focusing on advancing green railway construction, promoting low-carbon transformation of equipment, optimising and adjusting the transportation structure, and advancing green operation and maintenance, thereby promoting the green and low-carbon development of railways, providing strong support for serving the comprehensive green transformation and development of the economy and society, and accelerating the construction of a beautiful China."
4)		- Discount only for students identified with ID card, additional information is name, school, family location and expected graduation year - Who? : students from Full-time institutions of higher learning; Scientific research institutions of postgraduate education tasks; Military institutions; Ordinary primary and secondary schools; Formal religious institutions approved by the State Council or State Administration of Religious Affairs	

		- Each academic year 4 one-way student discount tickets can be purchased between family residence and location of institution/internship - Ticket includes only hard seats/sleepers and second-class seats	