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Integrating the railway infrastructure with cycling tourism.

Opportunities for achieving sustainable territorial development in Greece.

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In memory of the lives that have ended in road 'accidents'

caused by others not doing their job properly.

Summary

This study aims to explore how cycling tourism integrated with railway infrastructure, could create opportunities for achieving sustainable territorial development in Greece, particularly in the Peloponnese region where has a railway network in idle condition already exists. The complementary use of cycling tourism and railway infrastructure could offer a multifaceted strategy for sustainable tourism and sustainable territorial development. Tourism, as one of Greece's leading sources of revenue, can diversify by focusing on the region's strengths, such as natural landscapes, historical sites and local cultures, rather than solely relying on coastal tourism. In doing so, it can potentially improve rural areas and its economies, while preserving natural values and promoting environmentally friendly travel to revitalise rural economies. This integrated approach could create a new tourism product for Greece which holds promise for both environmental sustainability and socio-economic benefits, positioning Greece as a possible destination for cycling tourists and sustainable travellers.

Railway systems, known for their efficiency and low environmental impact, can make a significant contribution to sustainable transportation. When integrated with cycling tourism — a burgeoning sector that enhances public health through active travel, mitigates carbon emissions and traffic congestion, conserves environmental resources and stimulates local economies — this combination presents considerable potential for positive outcomes. To explore the impact of this integration on rural development, Greece offers a valuable landscape with its historical and cultural heritage, diverse landscapes, and existing but underutilized railway infrastructure. The revitalisation of the Peloponnese railway infrastructure and its integration with a well-planned network of cycling routes present a significant opportunity to investigate the effects of this integration on rural development.

Keywords: cycling tourism, railways, territorial development, Greece, sustainability

Sintesi

Questo studio si propone di esplorare come il cicloturismo, integrato con la rete ferroviaria possa creare opportunità di sviluppo territoriale sostenibile in Grecia, in particolare nella regione del Peloponneso, dove esiste già una rete ferroviaria dismessa. L'uso complementare del cicloturismo e delle infrastrutture ferroviarie potrebbe offrire una strategia poliedrica per il turismo sostenibile e lo sviluppo territoriale sostenibile. Il turismo, una delle principali fonti di reddito della Grecia, può diversificarsi concentrandosi sui punti di forza della regione, come i paesaggi naturali, i siti storici e le culture locali, anziché affidarsi esclusivamente al turismo costiero. In questo modo, può potenzialmente migliorare le aree rurali e le sue economie, preservando le risorse naturali e promuovendo viaggi meno impattanti sullº ambiente per rivitalizzare le economie rurali. Questo approccio integrato potrebbe creare un nuovo prodotto turistico per la Grecia, promettente sia per la sostenibilità ambientale che per i benefici socio-economici, posizionando il paese come possibile destinazione per cicloturisti e viaggiatori sostenibili.

I sistemi ferroviari, noti per la loro efficienza e il basso impatto ambientale, possono dare un contributo significativo al trasporto sostenibile. Se integrata con il cicloturismo - un settore in crescita che migliora la salute pubblica attraverso la mobilitá attiva, attenua le emissioni di carbonio e la congestione del traffico, conserva le risorse ambientali e stimola le economie locali - questa combinazione presenta un notevole potenziale di risultati positivi. Per esplorare l'impatto di questa integrazione sullo sviluppo rurale, la Grecia offre un paesaggio prezioso con il suo patrimonio storico e culturale, la diversità dei paesaggi e le infrastrutture ferroviarie esistenti ma sottoutilizzate. La rivitalizzazione dell'infrastruttura ferroviaria del Peloponneso e la sua integrazione con una rete ben pianificata di percorsi ciclabili rappresentano un'opportunità significativa per studiare gli effetti di questa integrazione sullo sviluppo rurale.

Parole chiave: cicloturismo, ferrovie, sviluppo territoriale, Grecia, sostenibilità

Περίληψη

Η παρούσα μελέτη αποσκοπεί στη διερεύνηση του τρόπου με τον οποίο ο ποδηλατικός τουρισμός, ενσωματωμένος με τη σιδηροδρομική υποδομή, θα μπορούσε να δημιουργήσει ευκαιρίες για την επίτευξη βιώσιμης τοπικής ανάπτυξης στην Ελλάδα, ιδίως στην περιοχή της Πελοποννήσου, όπου υπάρχει ήδη ένα σιδηροδρομικό δίκτυο σε κατάσταση αδράνειας. Η παράλληλη χρήση του ποδηλατικού τουρισμού και της σιδηροδρομικής υποδομής θα μπορούσε να προσφέρει μια πολύπλευρη στρατηγική για βιώσιμο τουρισμό και βιώσιμη τοπική ανάπτυξη. Ο τουρισμός, ως μία από τις κύριες πηγές εσόδων της Ελλάδας, μπορεί να διαφοροποιηθεί εστιάζοντας στα δυνατά σημεία της περιοχής, όπως τα φυσικά τοπία, τα ιστορικά μνημεία και την τοπική κουλτούρα, αντί να βασίζεται αποκλειστικά στον παράκτιο τουρισμό. Με τον τρόπο αυτό, μπορεί δυνητικά να συμβάλλει στην ανάζωογόνηση των αγροτικών περιοχών και των οικονομιών τους, διατηρώντας παράλληλα τις φυσικές αξίες και προωθώντας ταξίδια φιλικά προς το περιβάλλον. Αυτή η ολοκληρωμένη προσέγγιση θα μπορούσε να δημιουργήσει ένα νέο τουριστικό προϊόν για την Ελλάδα, το οποίο υπόσχεται τόσο περιβαλλοντική βιωσιμότητα όσο και κοινωνικοοικονομικά οφέλη, τοποθετώντας την Ελλάδα ως πιθανό προορισμό για ποδηλατικούς τουρίστες και ταξιδιώτες με βιώσιμες μορφές μετακίνησης.

Τα σιδηροδρομικά συστήματα, γνωστά για την αποδοτικότητά τους και τις χαμηλές περιβαλλοντικές επιπτώσεις τους, μπορούν να συμβάλουν σημαντικά στις βιώσιμες μεταφορές. Όταν συνδυάζονται με τον ποδηλατικό τουρισμό - έναν αναπτυσσόμενο τομέα που ενισχύει τη δημόσια υγεία μέσω των ενεργών μετακινήσεων, μετριάζει τις εκπομπές διοξειδίου του άνθρακα και την κυκλοφοριακή συμφόρηση, εξοικονομεί περιβαλλοντικούς πόρους και τονώνει τις τοπικές οικονομίες - ο συνδυασμός αυτός παρουσιάζει σημαντικές δυνατότητες για θετικά αποτελέσματα. Για τη διερεύνηση του αντίκτυπου αυτής της ενσωμάτωσης στην αγροτική ανάπτυξη, η Ελλάδα προσφέρει ένα πολύτιμο τοπίο με την ιστορική και πολιτιστική κληρονομιά της, τα ποικίλα τοπία και την υπάρχουσα, αλλά ανεκμετάλλευτη, σιδηροδρομική υποδομή. Η αναζωογόνηση της σιδηροδρομικής υποδομής της Πελοποννήσου και ο συνδυασμός της με ένα καλά σχεδιασμένο δίκτυο ποδηλατικών διαδρομών αποτελεί μια σημαντική ευκαιρία για τη διερεύνηση της επίδρασης αυτής της ενσωμάτωσης στην αγροτική ανάπτυξη.

Λέξεις κλειδιά: ποδηλατικός τουρισμός, σιδηρόδρομοι, τοπική ανάπτυξη, Ελλάδα, αειφορία.

Özet

Bu çalışman amacı, bisiklet turizminin demiryolu altyapısıyla bütünleştirmenin, Yunanistan'da, özellikle halihazırda atıl durumda bir demiryolu ağına sahip Mora bölgesinde, sürdürülebilir bölgesel kalkınmanın sağlanmasına nasıl yaratabileceğini araştırmayı araştırmaktır. Bisiklet turizmi ile demiryolu altyapısının tamamlayıcı kullanımı, sürdürülebilir turizm ve sürdürülebilir bölgesel kalkınma için çok yönlü bir strateji sunabilir. Yunanistan'ın önde gelen gelir kaynaklarından biri olan turizm, sadece kıyı turizmine yönelmek yerine bölgenin doğal manzaraları, tarihi yerleri ve yerel kültürler gibi güçlü yönlerine odaklanarak turizmi çeşitlendirebilir ve bu yolla kırsal alanları ve ekonomilerini iyileştirebilir; aynı zamanda doğal değerleri koruyarak ve çevre dostu seyahati teşvik ederek kırsal ekonomileri canlandırma potansiyeline sahiptir. Bu bütünleşik yaklaşım, Yunanistan için hem çevresel sürdürülebilirlik hem de sosyo-ekonomik faydalar vaat eden yeni bir turizm ürünü yaratma potansiyeline sahiptir; aynı zamanda Yunanistan'ı bisikletli turistler ve sürdürülebilir gezginler için çekici bir destinasyon haline getirmektedir.

Demiryolu sistemleri verimlilikleri ve düşük çevresel etkileri sayesinde, sürdürülebilir ulaşımın sağlanmasında ve mekânsal olarak yaygınlaştırılmasına önemli bir katkı sağlamaktadır. Bisikletli turizm ve raylı sistemler entegre düşünüldüğünde aktif seyahat aracılığıyla halk sağlığını korumak ve yerel ekonomileri canlandırmak gibi olumlu sonuçlar açısından dikkate değer bir potansiyel sunmaktadır. Bu entegrasyonun kırsal kalkınmaya etkisini keşfetmek için, Yunanistan, tarihi ve kültürel mirası, çeşitli manzaraları ve mevcut fakat yeterince kullanılmayan demiryolu altyapısıyla zengin bir peyzaj sunmaktadır. Peloponez demiryolu altyapısının canlandırılması ve bunun iyi planlanmış bir bisiklet rotaları ağı ile entegrasyonu, bu entegrasyonun kırsal kalkınmaya etkilerini araştırmak için önemli bir fırsat oluşturmaktadır.

Anahtar Kelimeler: bisiklet turizmi, demiryolları, bölgesel kalkınma, Yunanistan, sürdürülebilirlik

Acknowledgements

Riding a bicycle changed my path a few times: In my thirties, I quit my corporate job in a well-known international company and co-founded Turkey's first touring bicycle shop, Bisiklet Gezgini. Then with like-minded women, the Women on Bicycle Initiative to increase the number of women in another male-dominated field. Then, in my early forties, I migrated twice, and went through a pandemic, a major earthquake and vicious wildfires very close to my home. For me, this master in social sciences was an attempt to see the world from a different perspective and a way of understanding and deepening the roots of my practical experiences. As an engineer older than some of my professors, it was not easy but at the same time, it was so empowering. Then this thesis created a way of perceiving my new country, while at the same time learning its language and traditions, all of which marked a shift to my new path in life. So, it is no coincidence that it is about cycling.

I would like to thank all my professors at MOHU, especially those who led the way in creating this programme and those who dared to go outside the classical education system. Among my many professors, one has a special place, not only because she is my supervisor, but also because she became a guide for me on this journey. Chiara Rabbiosi, thank you for your patience in shaping the mindset of a mechanical engineer from engineering to social sciences.

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Στον Α., τον σύντροφο της ζωής μου, είθε να ζήσουμε πάντα μαζί.

To my biological family; Pembegül, Ahmet and Sevil. If I have been able to add anything to this soul and mind, it is because of the solid foundation you have laid. Love and miss you.

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List of Abbreviations

EOT - The Greek National Tourism Organisation / Εθνικός Οργανισμός Τουρισμού

ETCS - European Train Control System

EU - European Union

GDP - Gross domestic product

GNTB - The German National Tourist Board

HLAG-ST - High-Level Advisory Group on Sustainable Transport

HRADF - The Hellenic Republic Asset Development Fund / Ταμείο Αξιοποίησης Ιδιωτικής Περιουσίας του Δημοσίου, ΤΑΙΠΕΔ

JPOI - The Johannesburg Plan of Implementation

NCS - National Cycling Strategy

NTUA- National Technical University of Athens / Εθνικό Μετσόβιο Πολυτεχνείο

OECD - Organization for Economic Cooperation and Development

ÖRV - Austrian Travel Association / Österreichischer Reisebüroverband

SDGs - Sustainable Development Goals

SETE - The Greek Tourism Confederation / Σύνδεσμος Ελληνικών Τουριστικών Επιχειρήσεων, ΣΕΤΕ

SUMPs - Sustainable urban mobility plans (SVAK in Greek)

SPAP - Piraeus-Athens-Peloponnese Railways / Σιδηρόδρομοι Πειραιώς-Αθηνών-Πελοποννήσου, Σ.Π.Α.Π.

TRAN - The European Parliament's Committee on Transport and Tourism

UN - United Nations

UNECE - United Nations Economic Commission for Europe

UNFCCC - The United Nations Framework Convention on Climate Change

UNWTO - The United Nations World Tourism Organization (until 2023, now UN Tourism)

VNR - Voluntary National Review

WCED - World Commission on Environment and Development

0. Introduction

Greece is a country where a large percentage of the individual and national income is derived from the shipping industry and from tourism. Almost half of the country's population lives in the capital, Athens, and the majority of tourists prefer a few popular destinations, with little knowledge of what other parts of the country have to offer. These two small pieces of information help us to understand how the resources of the country are unequally distributed, both for the people who have to live in densely populated areas and for those who live in rural areas. The country has natural, culinary, cultural and historical resources and should not rely on only these two sources of income. The country has the potential for diversification of income resources and an appropriate population distribution is achievable. The aim of this thesis is to present this inequality in related areas and to propose an alternative model for sustainable territorial development, in part through the use of sustainable multimodal transport modes: rail and cycling.

0.1 Background

The concepts of sustainability and development can be applied in many areas, such as transport, tourism and the economy, and at different scales, from a small village to a large region. With the increasing impact of climate change and environmental concerns, the term ‘sustainability’ has entered our lives. Today many institutions, from companies to non-governmental organisations (NGOs), from policy makers to states, use these two terms combined. The need, the aim, the parties involved, the necessity and all the other practices of sustainable development could be discussed in different contexts; this study will follow the definition of the term in “Our Common Future/Brundtland Report” by the World Commission on Environment and Development (WCED) in 1987 as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. The definition emphasizes the relationship between different areas (such as the economy, the environment, social justice etc.) which are intertwined and must support each other. In this thesis, the integration of two sectors relevant to the achievement of sustainable development will be examined, namely transport and tourism, in particular with reference to the integration of railways and cycling.

The role of transport in sustainable development was first recognized at the 1992 United Nations Earth Summit. Further, at the 2002 World Summit on Sustainable Development, the

role of transport was once again captured in the outcome document, the Johannesburg Plan of Implementation (JPOI). JPOI provided multiple anchor points for sustainable transport, in the context of infrastructure, public transport systems, goods delivery networks, affordability, efficiency and convenience of transportation, as well as improving urban air quality and health, and reducing greenhouse gas emissions. This global attention continued at the 2012 United Nations Conference on Sustainable Development (Rio+20), where world leaders acknowledged that transportation and mobility are central to sustainable development. They recognized that sustainable transportation can promote economic growth, improve accessibility and integrate economies, while respecting environmental limits, enhancing social equity, health, and the resilience of cities, and boosting productivity in rural areas. In response to these imperatives, the UN Secretary-General launched a High-Level Advisory Group on Sustainable Transport (HLAG-ST) in 2014, comprising representatives from various transport modes. This group produced policy recommendations aimed at advancing sustainable transport, culminating in the report "Mobilizing Sustainable Transport for Development," released at the first Global Sustainable Transport Conference in 2016. Looking forward, sustainable transport is integral to the 2030 Agenda for Sustainable Development, intersecting with several Sustainable Development Goals (SDGs) and targets related to food security, health, energy, economic growth, infrastructure, and sustainable cities. Moreover, the transport sector's role in climate action is emphasized under The United Nations Framework Convention on Climate Change (UNFCCC), particularly in achieving the objectives of the Paris Agreement, as a substantial portion of global greenhouse gas emissions originate from transport and are projected to increase significantly. In summary, sustainable transport is described as "the provision of services and infrastructure for the mobility of people and goods—advancing economic and social development to benefit today's and future generations—in a manner that is safe, affordable, accessible, efficient, and resilient, while minimizing carbon and other emissions and environmental impacts" (HLAG-ST, 2016, p.10)

In 2001, The World Tourism Organisation (UNWTO) defined sustainable tourism development as meeting "the needs of present tourists and host regions while protecting and enhancing opportunities for the future. It is envisaged as leading to management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity and life support systems."

The intimate connection between the future of tourism and transport in the global economy must be discussed emphasizing the need for sustainable practices, particularly for territorial development. The current trajectory of tourism growth must be criticized through the shift toward newer forms of tourism characterized by greater awareness of environmental and social impacts.

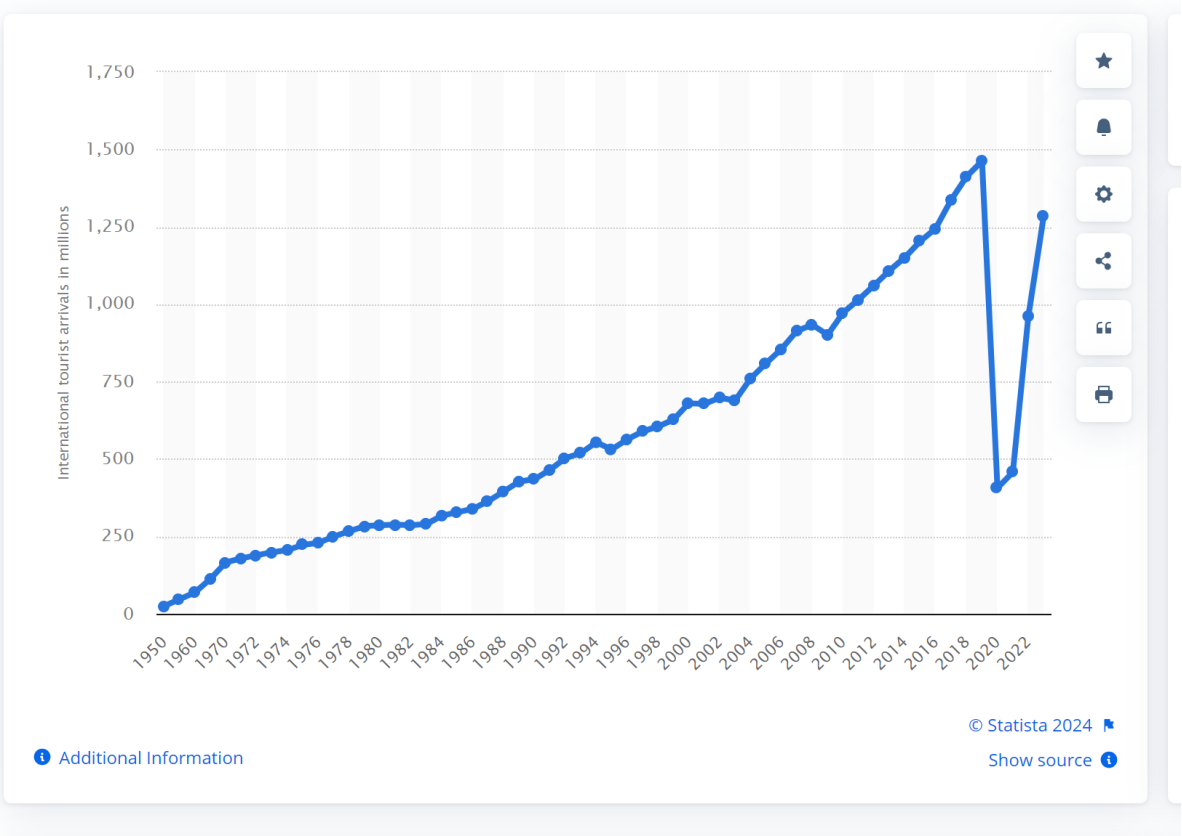
Slow travel emerges as a potential solution that may reduce carbon emissions and reshape tourism experiences. It questions the practice of taking long flights (with a huge carbon footprint) and then having a "slow" holiday at the destination. The transition to a low-carbon tourism sector is seen as essential for future development, although challenging given existing economic paradigms. Hall (2009) has termed the current approach as 'economism', that is "a policy framework which focuses on growth as represented by gross domestic product (GDP) and employment, rather than on human and social costs and benefits associated with tourism development" (Dickinson and Lumsdon 2010, p.14). Slow travel is positioned as a response to these challenges, offering a pathway toward sustainable tourism development. It opens a new perspective as an environmental alternative, a sustainable practice of travel in the tourism industry, as well as in the regions affected by tourism.

0.2 Problem: The increasing and uneven demand on tourism

In the 1990s, the global demand for tourism increased as predicted by The World Tourism Organization's Tourism 2020 Vision forecast report; a twofold increase in international arrivals by 2020 became real and contributed to an unsustainable transport system (Lumdson 2000). According to the first World Tourism Barometer of the year 2024 by UNWTO, with an estimate of 1.3 billion international arrivals, the international tourism at the end of 2023 was at 88% of pre-pandemic levels while in 2024, a full recovery is expected with a 2% growth above 2019 levels.

The demand is increasingly diversified from one long holiday to multiple shorter ones; maturing products also appear to be enjoyed by visitors who can afford their steeper price. The increasing use of the internet must be mentioned in this process (as a sales point before beginning the travel) as well as the mind-shift of regarding leisure time as a commodity; other changes include the use of the Euro as a single currency in Europe (which affected more intraregional travels) and the increase of the number of low-cost airlines. The demographics of the traditional tourist are also changing, as family holidays are increasingly replaced by more

diverse segments of the population. Awareness of certain issues, such as the environment, is also important in understanding the growth and diversity of demand. (sete.gr & UNWTO)



Graph 1: Number of international tourist arrivals worldwide from 1950 to 2023 (in millions) (Statista 2024)

The increase in environmental awareness also affected tourism development in terms of destination decisions and sustainability. Some niche tourism products have been created due to the demand, while so-called sustainable tourism initiatives appeared. However, transport systems have not been designed considering these so-called sustainable holidays (rural escapes, short breaks, self-catering holidays, city breaks, out-of-season holidays, activity-based trips, and so on) such as visiting a bio farm (which one can only get to by a flight and car combination!) This has to be questioned in terms of sustainable territorial development, as it could lead to the consumption of space without long-term benefits for the regions, even to the destruction of the local qualities of the region, such as the environment, nature, local culture, etc. Overcrowding (because of all-inclusive holidays, cheap flight tickets, mass market tourism etc.) in known destinations leads people to seek more remote and less known places; however,

these should be protected from being overrun by tourism and meeting the fate of the well-known tourist destinations. (sete.gr & UNWTO)

Switzerland is promoting train journeys from neighbouring countries, in order to reduce arrivals by plane, so as to protect its pollution-free environment. For example, the train station of Verona is full of advertisements for trains to Switzerland's different attractions. In 2021, France banned domestic airline flights on routes that can be reached by direct train in less than two and a half hours, as part of a series of climate and environmental measures. The German National Tourist Board (GNTB) aims to strengthen tourism in rural areas, highlights regional examples of the sustainable circular economy, raises the profile of different regional traditions and promotes travel outside peak season. For these, the GNTB has established partnerships which they name "sustainability partnerships"; such as the cooperation established with Cittaslow (an international network of cities characterised by a generally slower lifestyle), Magic Cities (a marketing association representing 10 major city destinations in Germany) and Historic Highlights (17 German cities with a historical heritage from Roman times to the modern day) and the German UNESCO World Heritage Sites Association (established in 2023). They do not just promote cities' sustainable tourism offerings as a marketing tool, but also improve sustainable cross-border travel. Eva Buzzi, Managing Director of Rail Tours Touristik GmbH and President of the Austrian Travel Association (ÖRV), declares "Sustainability is a key topic for visitors travelling to and within Austria. And sustainability encompasses everything from the mode of transport to practices at the local destination and the use of sustainable and regional produce. Transport is a major issue when it comes to carbon emissions. We in the travel industry are part of the problem. But we can and want to be part of the solution. This is illustrated by our close cooperation with the GNTB, with which we have been working in partnership for 14 years. One of our achievements is the steady increase in the number of people travelling to Germany by train. This is a great way of helping to redesign the world of travel and therefore create a better future for our grandchildren" (Making Tourism More Sustainable, GNTB, 2022).

By focusing on the increasing and uneven demand for tourism, this research aims to provide actionable insights on how the integration of rail and cycling tourism can contribute to a more balanced and sustainable territorial development in Greece, which is experiencing rapid and uncontrolled tourism growth in recent years and a disproportionate population distribution for decades.

0.3 Relevance

The increasing and uneven demand for tourism has significant implications for sustainable territorial development everywhere. This demand causes disruption both in the environment and on social issues. Building new infrastructure to meet demand harms the ecosystem and creates an uneven distribution of income and social rights for among residents of rural areas. Such pressure may be more evenly distributed, across different areas, by means of a properly designed transportation network, which may be used by both locals and tourists. To develop strategies that integrate railway infrastructure with cycling tourism, mitigate negative impacts and enhance positive outcomes, it is essential to understand the effect of this uneven demand.

There are complex challenges and opportunities for sustainable development arising from the increasing and uneven demand for tourism in Greece. The integration of railway infrastructure with cycling tourism would allow these impacts to be addressed comprehensively. It would promote environmental protection, economic equity, social harmony and efficient resource management. As well as supporting the sustainable growth of tourism, this approach would also contribute to the wider objectives of territorial development and regional balance in Greece.

0.4 Research question

What are the spatial and social challenges of the integration of railways and cycling tourism with the aim of lowering impact on the environment while improving sustainability and regional development?

0.5 Research objectives

0.5.1 Aims and scope

The aim of this work is to address the spatial and social challenges of sustainable travel by exploring tourism transport through the integration of low-carbon options, such as rail and cycling. To do so, this work will look into the themes of tourism and transport geography in order to explore how the integration of railway infrastructure and cycling tourism can be used as a tool for sustainable territorial development in Greece.

The integration of rail transport and cycling tourism in Greece remains underdeveloped, despite the recognised benefits of both. Challenges such as outdated facilities, limited connectivity and

underinvestment affect the country's rail infrastructure. Likewise, cycling infrastructure is often fragmented and lacking comprehensive planning. Addressing these gaps through integrated strategies could improve sustainable and equitable mobility, distribute the already booming tourism more evenly and contribute to overall regional development, by ensuring long-term benefits for both the environment and the local communities.

0.5.2 Specific objectives

The specific objectives of this work are:

- Analyse the current situation of cycling tourism in Greece; routes, cyclists and resources.
- Evaluate the existing railway infrastructure in Greece and its use and capacity to support cycling tourism.
- Investigate the sustainable territorial development challenges and opportunities of integrating the railway infrastructure with cycling tourism in Greece.

These specific objectives will be pursued for exploring and assessing the general objective, which is to develop a roadmap for the integration of railway infrastructure with cycling tourism, for the benefit of the environment, the economy and the local communities in Greece.

1. Literature review

1.1 From Regional Development to Sustainable Development

Since the 1960s and 1970s, local and regional development has become increasingly important globally, where it plays a vital role in the global economy. Globalization has amplified the significance of transforming localities and regions, although this transformation has been uneven, resulting in diverse outcomes, including economic growth and widening inequalities. Globalization, through increased mobility of capital and goods, has reshaped economies, leading to both opportunities and challenges. Globalization has also worsened social and territorial inequalities, with evidence of increasing social exclusion and a growing informal economy. This process has led to greater social and geographical polarization, with a widening gap between stable wage earners and insecure workers. (Pike, Rodriguez-Pose and Tomaney 2016)

Only a few localities and regions are benefiting significantly from globalization by offering something unique to global markets. According to Pike et al. (2016), these can be categorized into three groups:

1. **Large metropolitan regions:** Major urban centres in both developed and developing countries concentrate high-value service activities. Industries such as business, finance, real estate, and insurance cluster in these areas. They also attract research, development, and design activities. However, not all residents of these urban centres benefit equally, as many face economic deprivation and low-wage, precarious employment.
2. **Intermediate industrial regions:** These areas offer a combination of lower labour costs compared to core areas and better human capital and accessibility compared to peripheral regions. They attract industrial investments seeking cost advantages.
3. **Tourist regions:** Some developing regions have found success in the global economy by catering to tourism.

Some territories adapted to the new economic context, while some others could not, which resulted in economic imbalances. In order to overcome imbalances, some local and regional development strategies were adopted, instead of traditional development programmes; the method produced some social benefits. Local and regional development strategies empower communities by giving them more control over economic activities in their area. This autonomy

fosters sustainable development and encourages locals to take a proactive role in shaping their economic, social, and political future. Local and regional development strategies promote transparency and accountability in local institutions, while encouraging the growth of civil society at the community level. This does not only have social benefits, but has resulted in economic benefits as well. Local and regional economic development strategies aim to integrate economic activity with the unique conditions and strengths of a specific area, fostering sustainable growth and employment in businesses better equipped to adapt to global economic shifts. Due to the engagement of local stakeholders and the anchoring of economic activities within a specific region, local and regional economic development strategies facilitate an overall enhancement in job quality.

Despite the advantages of local and regional development policies, Pike, Rodriguez-Pose and Tomaney (2016) point out notable disadvantages and risks:

- Time-consuming nature: Developing local and regional coalitions and coordinating stakeholders requires significant organisational effort and consumes considerable time and resources before actual development initiatives can commence.
- No guarantee of success: Even after establishing key institutions, there's no assurance of short-term, medium-term, or long-term success. Rapidly changing and complex contexts make identifying, designing, and implementing appropriate development strategies challenging.
- Risk of inappropriate strategies: Involving local and regional actors may lead to empowerment and transparency, but it doesn't guarantee the selection of effective strategies. There's a risk of adopting unbalanced strategies that may not foster sustainable development in the medium to long term.
- Influence of vested interests: Vested interest groups, public pressure for quick results, and populist politicians can lead to the adoption of short-term, highly visible policies. This may result in neglecting more balanced strategies with potentially greater long-term impacts.

The definition of regional development is complex because it can be shaped by the perception of its purpose and goals. Historically, growth, wealth creation, and job creation, mainly economic dimensions, have dominated these definitions. However, since the mid-1990s, the focus shifted to include social, ecological, political, and cultural concerns, in terms of the

importance of reducing social inequality, promoting environmental sustainability, and fostering inclusive governance.

There could be different reasons for the atrophy of a territory, as well as different solutions to improve its development. These solutions cannot be without consequences. In our case, overcoming the lack of a transport network which meets the needs of the people living and travelling in a given territory demands heavy investment. If the territory does not have its own sources of revenue, then foreign investment will be needed. It is to be expected that the investors will consider their own profits a priority, instead of the sustainable concerns of the territory. Mining could be a very good example of this. International mining companies come to the area and, while providing some jobs to the local people, they proceed with destroying the area's natural resources, for instance by cutting down forest trees to build roads and buildings for their own use, or by depleting local aquifiers.

Governments must form different partnerships for development and shift focus from economic growth to sustainable development, which prioritizes meeting current needs without compromising future generations. (Pike et al. 2016) Sustainable development should ensure the enrichment of the conditions of the territory in terms of its inhabitants' wealth, health, social and physical needs, as well as by protecting the territory's natural sources; physical, cultural and historical assets. If the construction of a specific transport network destroys nature, deteriorates the life quality of the local population or upsets the economical balance of the area, then different types of transport networks ought to be considered. Specifically, highways, which need more space (in terms of road and parking space), more investment and end up creating more pollution while being dependent on other resources (fuel) are not good for sustainable territorial development. Railway infrastructure asks for much less space and has the capacity of carrying more people and goods.

1.2 Sustainable tourism

As sustainability gained traction, it naturally entered the tourism sector in terms of sustainable tourism. Since the travel and tourism industry is one of the largest industries in the world, it has many effects on both the environment and society. In their work on frameworks and applications of sustainable tourism, Hashemkhani Zolfani, Sedaghat, Maknoon, and Zavadskas (2015) claim the concept of sustainable tourism aims to minimize the negative effects of tourism activities, while maximizing benefits for local communities and the environment

through economic, social, and environmental considerations, by ensuring the well-being of both present and future generations. “Sustainable tourism requires both the sustainable growth of tourism’s contribution to the economy and society and the sustainable use of resources and the environment, which will be gained by a deep understanding and proper management of tourism demand (Liu, 2013). This dynamic process is an application of many areas, like infrastructure, planning, transport, environment protection, culture and heritage, human and natural sources, energy etc. In 2012, Bramwell and Lane stated that there is considerable evidence that tourism is becoming less sustainable, primarily as a result of the sector’s rapid growth and limited progress towards implementing more environmentally friendly operations on a global scale (Bramwell and Lane 2012 p.13) and they stress the role of the state on pushing forward the required policies and they emphasize the need for social systems to be changed.

The numbers presented in previous sections show that the demands and the numbers in the tourism sector will continue increasing. The local, regional, national and global decision makers, and especially the people affected by those numbers should consider this increase carefully if they would like to benefit from the tourism sector in the long term. Sustainability involves management for the well-being of future generations. Tourism management should consist of infrastructure development, planning, transportation, environmental protection, cultural preservation, and sustainable use of natural resources and energy. The rapid and growing demand is putting sustainability at risk, highlighting the urgent need for a comprehensive policy framework and societal changes to address the challenges in an effective way. Sustainable tourism should be a strategic approach to harmonising tourism development with the conservation of culture, nature and community well-being, as well as a commitment to environmental protection. As we look to the future of tourism, it is imperative that we prioritise sustainability in all facets of industry practice and policy-making in order to safeguard our natural resources and enrich the experiences of travellers and host communities alike.

The feasibility of sustainable tourism development must be considered, by balancing the improvement of the economic situation of the local community, with any negative environmental and social impact. Economic impact is examined, using various indicators to assess sustainability (Hashemkhani Zolfani et al. 2015). Parameters for sustainability include viable economic operations, equitable socio-economic benefits distribution, stable employment and poverty alleviation.

1.3 Present demand and possible problems

During the pandemic, the numbers in tourism travel dropped significantly, but rose again after the pandemic, expected to reach pre-pandemic levels by the end of 2024. “These numbers also recall the critical task of furthering sustainability and inclusion in tourism development” says UNWTO Secretary-General Zurab Pololikashvili (2024). This increase should not be welcomed without caution. Although there is a tendency to travel closer to home and sustainable practices by consumers’ choices are on the rise, sustainable tourism development involves a holistic approach that considers environmental, socio-cultural, and economic factors, requiring collaboration among stakeholders and continuous efforts to mitigate negative impacts and promote sustainable practices.

This approach, defined by UNWTO, for a sustainable tourism, includes the following parameters:

1. Make optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural heritage and biodiversity.
2. Respect the socio-cultural authenticity of host communities, conserve their built and living cultural heritage and traditional values, and contribute to inter-cultural understanding and tolerance.
3. Ensure viable, long-term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed, including stable employment and income-earning opportunities and social services to host communities, and contributing to poverty alleviation.

1.4 The role of transport in the development of sustainable tourism

1.4.1 Slow tourism

As an emerging concept, slow travel encourages people to travel at a slower pace (by using overland transport instead of flying or driving long distances), to stay longer in the destinations (by not moving rapidly between different locations) and to travel less frequently (by reducing the number of trips taken). All of these practices support sustainability by reducing carbon emissions and providing of a more conscious, fulfilling travel experience. According to Dickinson and Lumsdon (2010), slow tourism also encompasses more experiential elements

such as: the importance of the travel experience to, and within, a destination, engagement with the mode(s) of transport, associations with slow food and beverages, exploration of localities in relation to heritage and culture at a slower pace and, what might best be described as, support for the environment. While the literature investigates the relation between transport and tourism, much of the work relates to transport as a means of destination development and as an enabler of tourism where speed, access and travel cost are key elements (Prideaux, 2000) and Dickinson et al. (2010) focus also on a counter argument "whereas the journey to and around the destination is an important concept within slow travel, and slow travel refers to the whole tourist experience." (p.5) This point is very important, since one of the topics of this thesis is sustainable territorial development. The need for efficient travel systems that are fast, price-sensitive, and connect directly originating markets to destinations is discussed by noting the persistence of traditional supply chain structures, despite changes in holiday preferences and the rise of internet distribution. The process still relies on batch production of air travel, heavy utilization of accommodation, and large-scale infrastructure development.

The tourism sector contributes about 5% of global greenhouse gas emissions, which may seem small, initially, but is significant when compared to emissions from commercial buildings. There is concern that the sector's growth may lead to increased use of finite natural resources. Tourism has been slow to adapt or mitigate climate change effects, with a tendency toward reactive rather than proactive measures. While slow travel is not a perfect solution, it is part of broader sustainable tourism efforts striving for more responsible practices. "The explanation as to why the travel element is worthy of development is compelling. If travel accounts for between 75 and 90 per cent of all of the carbon emissions accruing from tourism, then the issues of spatial distance and energy intensity of mode of transport are key factors in any strategy to reduce impacts" (Dickinson et al. 2010, p.8). The challenges facing the tourism sector in adapting to a new paradigm, focused on lower resource consumption and reduced environmental impact, highlight the slow response of the tourism industry to climate change and the need for government intervention to address emissions. The potential decline of long-haul tourism, particularly in the face of dwindling resources and climate change impacts, must also be taken into consideration, as well as the rise of domestic travel in developing countries (in Asia, Africa and Latin America) and the evolution of pilgrimage into contemporary tourism forms. "Most developing countries aspire to modernize, and this currently involves increased mobility by car and two-wheeled powered vehicles. This includes the world's two giant

developing economies, India and China." (Dickinson et al. p.10) Overall, there is a need for rethinking tourism development, in the context of environmental constraints and changing market conditions.

In conclusion, by offering a deliberate shift, from fast-paced, resource-intensive travel, to more mindful and experiential travel, slow tourism is emerging as an important conceptual framework within sustainable territorial development. Dickinson et al. (2010) point out that slow travel promotes greater engagement with places, supports the local economy and reduces environmental impacts through the preference for land travel and longer stays. In line with wider sustainable tourism efforts to reduce carbon emissions and promote responsible travel practices, such an approach not only enhances the travel experience but also promotes cultural preservation and environmental management. Embracing the principles of slow tourism is becoming increasingly important in shaping a more sustainable future for destinations worldwide as global tourism faces the challenges of climate change and resource scarcity.

In keeping with the principles of reducing environmental impacts and enhancing local experiences, sustainable transport is crucial to slow tourism. By promoting modes of transport such as rail and cycling, sustainable transport supports slower, more immersive journeys that prioritise the conservation of natural resources and cultural heritage. It fosters a deeper connection between tourists and destinations, while minimising carbon footprints.

1.4.2 Transport and tourism

The relationship between tourism and transport, which has been neglected as a fundamental part of the tourism experience, must be evaluated carefully, since sustainability does not start at the tourism destination. It must be regarded as an unbreakable whole, which begins with the mindset of the people while making their decisions about how they are going to spend their holidays and the mode of transport they will use. Lumsdon points out the relation between tourism and transport, which is of "fundamental importance in explaining the tourism system" (Lumsdon 2000, p.361), in a context where the mode of transport is no longer a service provided at the destination, but a sustainable way of reaching that destination. The discussion examines sustainability in the tourism industry from the aspect of transportation and questions the dominant modes of transport in the industry, namely air travel and motorised vehicles. Cycling tourism is evaluated as a sustainable option against "the world's two most energy consuming

and polluting forms of transport – air transport and the motorised vehicle" (p.361). Lumsdon examines the growth of transport and transport-related arguments and concerns in tourism, assessing cycling tourism, both as a mode of transport and as a tourism experience, from the perspective of sustainable development.

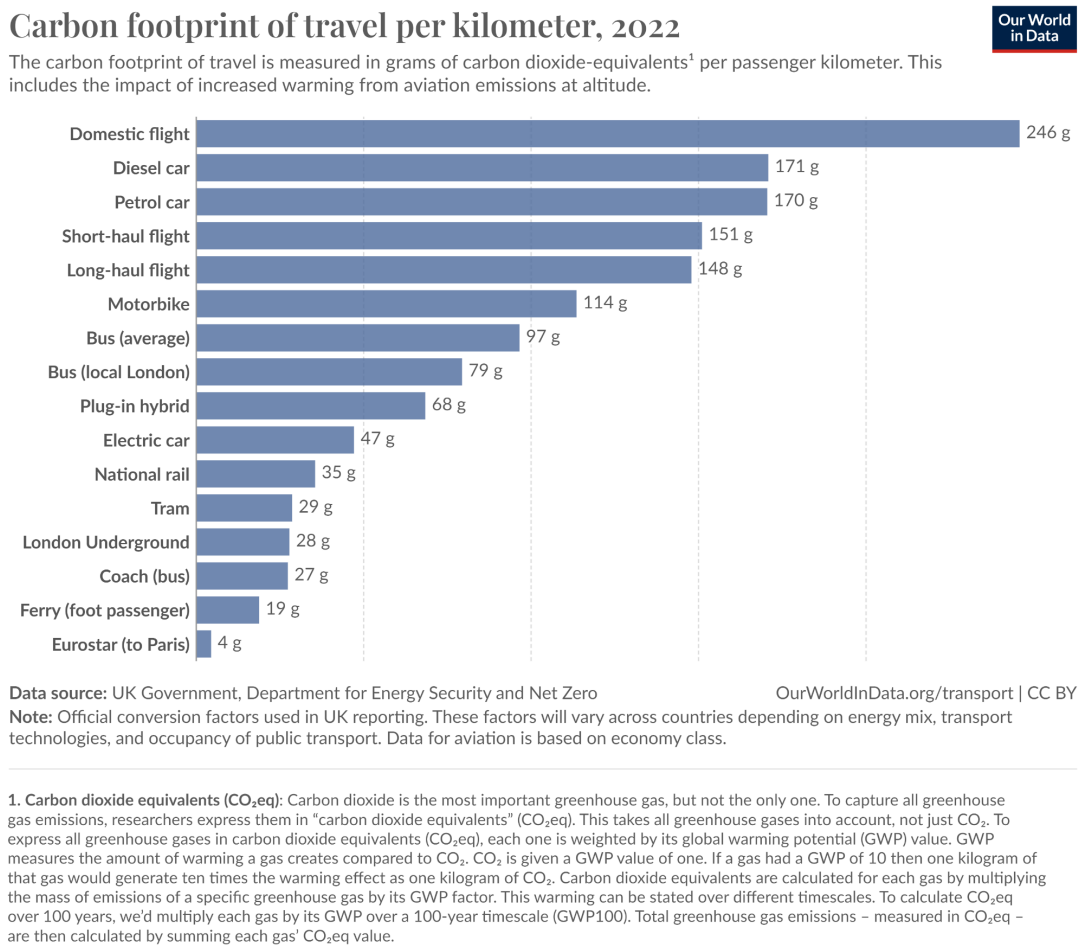
Two key issues are underlined in this topic: the first is the lack of integration between transport and tourism in sustainable development policies and the second is, despite environmental concerns, energy-intensive travel modes continue to be prioritised. As a result, other modes of transport are negatively affected by this imbalance, favouring car and air travel.

Tourism research often addresses the environmental impact of energy-intensive transportation systems. Lumsdon's article goes on to explore the possibility of designing non-motorised tourism transport systems, particularly focusing on cycling and its potential role in sustainable development at the destination level. The author suggests that studying tourism transport at a destination level may provide insights into how sustainable development principles could be applied more effectively. The focus on cycling as a non-motorised form of transport is seen as a way to promote sustainable alternatives to motorised vehicles, especially for short-distance trips within a destination. Finally, Lumsdon acknowledges challenges in shifting travel behaviour, particularly the growing car dependence in developed countries. However, it highlights changing consumer preferences, with evidence suggesting a decline in demand for heavily packaged holidays and a rising environmental consciousness among tourists.

1.4.3 Sustainable mobility

Promoting efficient, inclusive and environmentally friendly transport solutions, in order to reduce emissions and improve connectivity, has been at the heart of sustainable mobility in the EU's Common Transport Policy (CTP) since the 1990s. The development of the Trans-European Network (TEN) aims to create a coherent and integrated transport infrastructure across the EU, facilitating seamless travel and trade, while supporting economic growth and sustainability goals. The Trans-European Transport Network (TEN-T) framework emphasizes sustainability, digitalization, and resilience, aligning with the EU's broader goals such as the European Green Deal, which aims to make Europe climate-neutral by 2050. "The main aim of sustainable mobility is to find ways to facilitate movements of persons and goods in agreement with a strategy of sustainable development. The concept includes mobility levels, but also the

technical systems required to enable mobility" (Banister 2000 p.175). Transporting people from their homes to tourist destinations and mobilizing them once there, are examples of the transportation requirements that need to be carefully facilitated, if sustainability is to be achieved. This is because transportation produces air pollution, depletes water and land resources, produces solid waste and noise, negatively affects health and the build environment, and more. In order to minimize all these negative effects, sustainable modes of transport must be included at every stage of the tourism experience. The European Spatial Development Perspective (ESDP) emphasizes the need to achieve sustainable mobility by promoting multimodal transport systems and reducing dependency on car travel. It also advocates polycentric urban structures, to ensure balanced territorial development, thereby promoting economic growth and accessibility across different regions.



Graph 2: The carbon footprint of travel per kilometre (Our World in Data 2022)

The transport sector is responsible for around 25% of global carbon dioxide (CO_2) emissions from energy use. This means that transport plays a critical role in the global CO_2 emissions and the travel patterns need to be evaluated. As is the case in Europe, the wealthier one is, the more they travel and the greater their carbon footprint. Walking or cycling is the lowest carbon travel option, with cycling emissions ranging from 16 to 50 grams CO_2eq per kilometre over short to medium distances. Travel emissions can be reduced by about 75% by replacing car trips with cycling. Public transport, especially the train, is the next best option, if walking or cycling are not possible. Trains can reduce emissions by around 80% compared to cars for medium distances and by around 86% compared to domestic flights. Taking the Eurostar instead of a short-haul flight in France can reduce the carbon footprint of a trip by about 97% (Ritchie 2023).

1.4.4 Sustainable multi-modality

Sustainable mobility is a key factor in reducing the impact on the environment and promoting social equity. Efforts to develop an integrated, environmentally friendly transport infrastructure are exemplified by the EU's policies through different frameworks. By prioritising multimodal systems and reducing car dependency, these initiatives align with broader sustainability goals. The need for sustainable transport solutions to achieve climate neutrality, improve connectivity and support balanced economic growth is underlined by the fact that cycling and public transport produce significantly lower emissions than cars and air travel. Sustainable mobility not only reduces carbon emissions but also promotes healthier, more liveable areas.

Sustainable multi-modality is the integration of different modes of transport, including walking, cycling, public transport and car sharing, in a way that minimises environmental impact, improves social equity and promotes economic efficiency. Since different regions have different mobility challenges to face a single mode of transport is not a magic solution that can be applied to all. The combination of different modes of transport (here, rail and cycling) and their different uses (cycling tourism, urban cycling) could be the answer to wide array of problems. Sustainable multi-modality is becoming increasingly important in urban and regional planning. The case study of the regeneration of small and medium train stations in inland Italy, in order to promote cycling tourism, is an example of this integration, by using existing transport infrastructure and promoting alternative, sustainable travel options for achieving

sustainable multi-modality (Moscarelli, Pileri, Giacomel 2017). “Bicycle and train are complementary: train lets to cover long distance in few times, and bicycle is more flexible and lets to explore inland areas. Such strategy able to generate a synergy between these two mobility means, implies the development of a sustainable mobility involving both daily urban transfers and long trips to discover the territory around.” (Moscarelli et al. 2017, p.4)

Cycling tourism has the potential to attract visitors to inland areas that are typically overlooked by mainstream tourism. This form of tourism has the potential to increase passenger numbers on secondary railway lines and smaller stations. Activating railway stations in order to promote cycling tourism, through the introduction of new activities and functions, not only creates benefits for the development of the local economy, but also promotes environmental sustainability, as these can be used for both local mobility and tourism. This approach not only increases the attractiveness of cycling as a sustainable mode, but also takes advantage of existing rail infrastructure to provide a seamless multi-modal travel experience (Moscarelli, Pileri, Giacomel 2017).

In our case, integrating railways and cycling could activate processes which may lead to solving problems such as environmental pollution, by reducing the carbon footprint, as well as traffic congestion; this integration may also contribute to improving health, by promoting a more active mode of transportation. At the same time, it may enhance accessibility to rural areas, attract tourism to the countryside and boost local economies.

The social dimension of transport is also addressed by sustainable multi-modality. It is vital to ensure accessibility for all, regardless of physical ability, income level or geographical location. Affordable and inclusive transport options can bridge the mobility gap and provide equitable access to jobs, education and healthcare. Sustainable multi-modality also includes the optimization of existing infrastructure and investment into the integration of different modes of transport; this results in making life easier, not only physically but also financially.

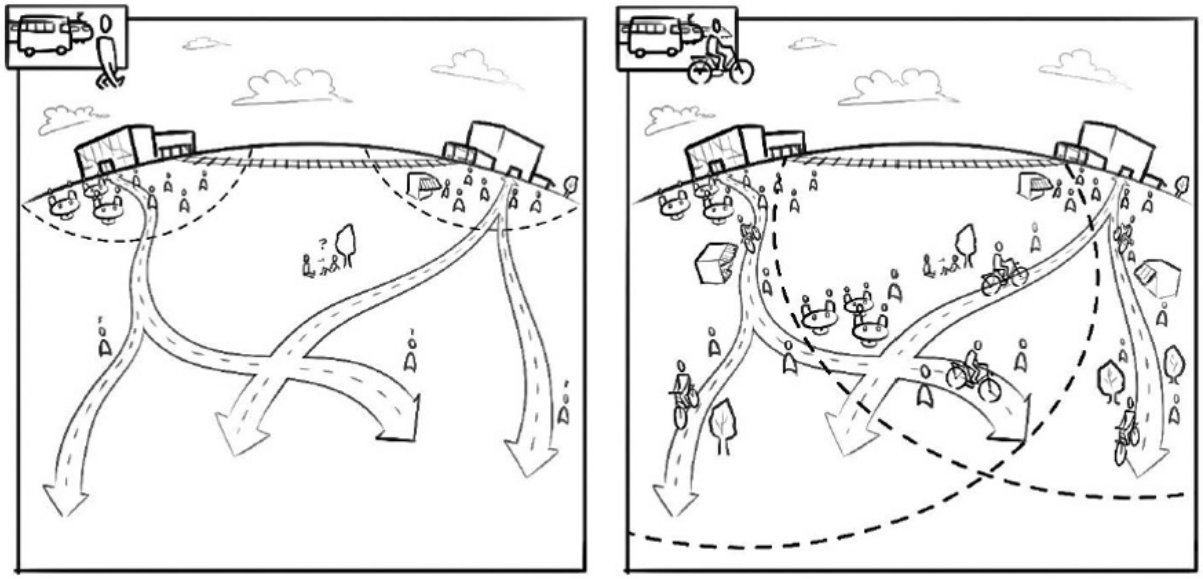


Figure 1: Mechanism of increased liveliness of public spaces (Kager and Harms, 2017)

Recognising the intrinsic link between social and environmental issues, policy makers should consider the triple bottom line model -Planet, People, Profit- to create value across all forms of capital. Leo Bormans (2020) highlighted the shift in urban dynamics, from community interaction to consumerism in cities by saying “cities have been built as marketplaces to meet each other but relationships between citizens have been replaced by consumerism, with people driving in the city just to buy things”. This underlines the need for policies that encourage people to interact with each other and to build social capital (Figure 1). One such approach is the growing focus on micro-mobility policies, such as walking and cycling. These aim to transform traffic spaces into public spaces, thereby increasing community engagement and environmental sustainability. Cities with a strong cycling system and culture have cut air pollution and carbon emissions by 93 per cent on a CO_2-per-kilometre basis. Cycling also reduces energy demand by reducing the need to produce, distribute and consume fossil fuels, thereby minimising mineral extraction, while increasing social capital, improving public well-being and localising economic activity (Cuvier 2023).

A critical dimension of sustainable multi-modality is the improvement of connections between trains and bicycles, which is highlighted by Moscarelli et al. (2017) as a way of making regions more accessible to both locals and tourists and promoting a path away from car-centric transport models. Another important issue they highlight is policies and planning that support the infrastructure investment and stakeholder collaboration for securing the sustainability and long-

term success of multi-modal transport networks. Initial investments, potential resistance from local communities and the complexity of coordinating multiple stakeholders are the challenges that the authors acknowledge, despite the very obvious benefits they propose. They advise further research for innovative funding mechanisms, enhancing community participation and creating a comprehensive framework for stakeholder collaboration.

Copenhagen is known for its extensive cycling infrastructure. It is an example of sustainable multi-modality. The city's bike-sharing programme has significantly reduced car use and emissions by promoting cycling and public transport as primary modes of travel, along with a well-connected public transport system. Sustainable multi-modality provides a comprehensive approach to the development of transport systems that are environmentally friendly, socially equitable and economically efficient. By integrating different modes of transport systems and focusing on accessibility, affordability and seamless connectivity, cities can create balanced and flexible transport networks. As well as supporting sustainable development goals, this will improve the quality of life for residents and could lead to a greener and socially balanced future.

1.5 A focus on rail and cycling tourism

1.5.1 Facts of cycling tourism

The relation of cycling and tourism dates back to the 19th century (Reid, 2015). Before motorised vehicles, cycling and rail were the primary modes of transport. Lamont (201) refers to the cycling tourism research literature since the late 1990s and points out its potential research areas as a multi and interdisciplinary subject. But since the 2010s cycling tourism has become a specific topic with the potential to integrate different sections, such as tourism, sport and leisure. Albeit diverse definitions of cycling tourism exists, Lamont defines cycling tourism as: “Trips involving a minimum distance of 40 kilometres from a person’s home and an overnight stay (for overnight trips), or trips involving a minimum non-cycling round trip component of 50 kilometres and a minimum four hour period away from home (for day trips) of which cycling, involving active participation or passive observation, for holiday, recreation, leisure and/or competition, is the main purpose for that trip. Participation in cycling may include attendance at events organised for commercial gain and/or charity (competitive and non-competitive), as well as independently organised cycling” (Lamont 2014). Lamont points out cycling tourism research by identifying the previous studies’ topics. These topics are

focused, first on the socioeconomic impact of cycling tourism and, secondly, on planning, management and policy issues.

Cycling in the context of tourism is by the way not just a means of transport; it is an integral part of the tourist experience (Lumsdon, 2000b). The journey is as important as the destination and, in some cases, it is the destination. It has been described by one visionary cycle route planner as the "travelling landscape" (Grimshaw 1998 p.7). In countries like Denmark, Germany and Holland, where a large proportion of people cycle every day, cycling tourism is flourishing, thanks to strong networks and significant investment in traffic-free infrastructure and marketing. Cycling tourism is also growing in countries without a strong tradition of daily cycling, such as Cyprus, Italy and Spain. There has been a lot of development of new facilities and that in itself has been attractive to the market. Major European cities such as Amsterdam, Barcelona, Berlin, Budapest, Copenhagen, Lyon, Paris and Seville are promoting cycling and walking over car use for both residents and tourists (Lumsdon et al. 2009).

Earlier research was mostly focusing on the environmental issues related to cycling tourism and its contribution to "tourism mobilities, climate change and dwindling fossil fuel reserves" (Lamont 20104 p.2). Researchers continue doing this kind of studies, but also point out a very important missing issue: the starting points of the cycling journey are arrived at by car, which is not environmentally friendly or sustainable. Here, the concept of slow tourism enters academic tourism studies. One of the main arguments is that slow travellers can function as key contributors for slowing down travel, thus reducing the carbon footprint of tourism-based activities. However, they only focus on walking and cycling. A shift in the mindset of the related parties, like travellers, is needed for low-carbon travel practices. This should be supported by policies for concrete sustainable transport modal choices. Lamont gives examples of case studies from different parts of the world (Taiwan, Australia, Belgium) with different applications, such as GIS-based methodology for collecting data, and using this data for planning and managing a national network. Research on planning and managing cycling tourism varies from regional development projects to community enterprises. 'Rail to trail' is a well-known practice for strengthening regional economies by converting old rail tracks to cycling and walking paths (Lamont 2014). Cycling tourism research is also interested in understanding the bicycle tourists' experiences; ethnography and auto-ethnography have been used to better comprehend cyclists' experiences (Lamont 2014). Cycling tourism research is

considered to be a multi-disciplinary inquiry since the 2010s, due to its bonds with economic and social outcomes for the local communities. The examples vary from mountain biking in Canada, sports heritage in tourism development in Belgium, analysis of expenditure and travel behaviours in the UK, case study of social exchange theory in New Zealand, socio-logical and socio-psychological perspective in Hawaii and health issues related to cycling tourism (Lamont 2014).

1.5.2 Background of cycling tourism's potential in Europe

In 2009, the European Parliament published a report written by academics from the Institute of Transport and Tourism, University of Central Lancashire, UK and the Centre for Sustainable Transport and Tourism, Breda University, the Netherlands (Lumsdon et al. 2009). They analysed cycling tourism opportunities available to the public on the internet: They found out that France is by far the most important destination for tour operators, followed by Austria. Scientific studies sourced from Germany, Switzerland, the Netherlands and the UK were also reviewed; these were supplemented by market research findings principally from Denmark, France and Spain. They also found out that there are no firm trends reported in the literature. Cycling tourism is not recorded in EuroStat tourism statistics nor is it featured in other general reviews of domestic or international tourism (Lumsdon et al. 2009).

The study above updated on 2012. An ECF report published in 2021 by using this data and it states that there are an estimated 2.3 billion cycle tourism trips in Europe every year with a value in excess of €44 billion, according to the study. 20.4 million cycle tourists stay one or more nights en route, and these 'overnight' tourists spend around €9 billion annually. In addition, cycling tourism is linked to over 500,000 jobs in the EU, which is more than the steel and cruise industries (ECF 2021). One of the world's largest tourism fair ITB Berlin (Internationale Tourismus-Börse Berlin) uses almost the same data. This shows the lack of data in the sector, as well as in academia. In the meantime, some institutions like ISNART (Istituto Nazionale Ricerche Turistiche) and Legambiente do their own research about cycling tourism by figuring out that "bicycle tourism now represents an important item in our country's tourism turnover, with a direct economic impact estimated at more than 5.5 billion euros as of 2023, up 35 percent over 2022 and 19 percent over 2019 (4.6 billion)." (Bikenomist 2024)

Cyclists are motivated by health benefits, relaxation and cultural learning, and prioritise safety, route variety and accommodation. However, cycling tourism is not consistently recorded in statistics, while its growth varies across Europe. Another very important finding of the report is that reaching cycling destinations often involves cars, especially in the UK. The report compares cycling with other forms of tourism; cycling tourism has a positive impact on local economies through direct spending, comparable to that of other forms of tourism. It also has a minimal impact on the environment, with benefits such as a reduction in CO_2 emissions. The seamless integration between transport modes is essential for effective cycling tourism. The ability to carry bicycles on trains varies from country to country, with Germany excluding the long-distance ICE, while Switzerland and the Netherlands allow the transportation of bicycles on most trains. The Third Railway Package (TRP) (2007) aims to increase the transportation of bicycles. In France, this has led to more bicycle spaces on services such as Thalys and TGV. Long-distance coaches are a limited alternative for transporting bicycles, as bicycles often have to be packed like air travel luggage. Ferries are crucial for cycling tourism across Europe, but their capacity to carry bicycles is underpublicized, despite operators' willingness. The report concludes that cycling tourism aligns with EU sustainable tourism policy but faces barriers such as insufficient transport-tourism integration and market presence. The study recommends the improvement of railway facilities for cyclists and the development of high-quality long-distance routes.

1.5.2.1 The role of the EuroVelo network

EuroVelo is a network of long-distance cycle routes across Europe that was launched in 1997 by the European Cyclists' Federation (ECF); an association of civil society organisations that advocate and work for more and better cycling. The network is developed and coordinated by the ECF and in 2030 aiming to be completed, it will be over 90,000 km long. If (and that is a big 'if') properly developed, EuroVelo could become a significant tourism asset, but it requires strategic planning and investment to strengthen its brand and actual, well-planned infrastructure across Europe. The development of EuroVelo will result in safe, direct, coherent and connected cycling infrastructure and cycle route networks, in conjunction with a network of National EuroVelo Coordination Centres (NECCs); however, this will require the collaboration between different stakeholders in different countries, using local knowledge and existing routes (ECF).

Figure 2: Map of the EuroVelo network (EuroVelo, 2024)

EuroVelo aims to promote sustainable tourism and reduce CO_2 emissions by:

- Promoting domestic tourism and reducing long-distance travel.
- Encouraging environmentally-friendly short-distance cross-border tourism.
- Encouraging the use of public transportation to reach cycling destinations.
- Reusing existing infrastructure, such as old railway tracks and canal towpaths.
- Stimulating economic development in rural areas.
- Diversifying land-based businesses for local tourism needs.
- Improving local residents' quality of life through increased physical activity.
- Generating minimal CO_2 emissions through cycling, and

- Encouraging slow travel that appreciates local culture, gastronomy, and heritage.

EuroVelo's objectives focus on several key areas:

(a) Reducing greenhouse gas emissions, while maintaining or enhancing tourism revenues.

(b) Promoting the use of rail, bus, and coach services for cyclists on long journeys.

(c) Stimulating enterprise through new small businesses catering to cycle tourists.

(d) Supporting biodiversity, enhancing cultural heritage, boosting local economies, and creating jobs in rural areas through sensitive development.

(e) Raising the profile of sustainable tourism as a branded European network, potentially becoming a model of best practice.

(f) Encouraging 'slow travel' to nearby destinations as an alternative to long-haul travel, fostering local tourism.

(g) Promoting stakeholder participation in regulation and sustainable tourism development. (ECF)

The development and promotion of EuroVelo emphasises the crucial role of sustainable transport in sustainable territorial development, as can be clearly seen from its aims and objectives. By prioritising sustainable tourism, EuroVelo aims to reduce CO_2 emissions, by increasing the use of cycling and public transport. It also aims to promote local tourism over long-distance travel. Besides reducing the impact on the environment, the initiative may also contribute to economic growth in rural areas, the promotion of biodiversity and the enhancement of cultural heritage. Its strategy to reuse existing infrastructure, stimulate small enterprises and encourage slow travel creates a comprehensive model for sustainable tourism that benefits both local communities and the environment. The importance of this initiative in shaping sustainable territorial development across Europe is underlined by the fact that it involves the participation of local stakeholders and can be used as a model for best practice. Ultimately, EuroVelo is an example of how the integration of sustainable transport solutions can have a broad, positive impact on environmental conservation, economic vitality and the well-being of local communities.

1.5.2.2 EuroVelo through national cycling strategies

EuroVelo is a network which uses the existing routes in different countries, provided they meet certain specific criteria. It also aims to promote sustainable tourism through national strategies and generate economic benefits. The Cycle Route Demand Forecast Model (CRDFM) has been designed in the report by Lumsdon et al. (2009) to provide estimates of the number of cycle trips per year, the trips, day trips and direct spending on those trips, per region and on a given cycle route, per region and overall. Their model is made available to local and regional tourism officials and other planners who would like to create new cycling routes. Since for many areas data is incomplete or unavailable, that of Western European countries was mostly used as a calibration tool while creating the model (Piket, Eijgelaar, Peeters 2013). As Piket et al. state, there are major barriers for the development of sustainable European cycling tourism such as difficulties and costs involved in transporting bicycles by rail or airplane. The lack of good-quality long-distance cycling routes in many non-Western European countries is also an obstacle to the development of a continuous cycling network; so it is the generally a low level of commitment to the promotion and development of cycle tourism on the part of tour operators and tourism service providers.

According to the ECF, out of the 54 European countries, 14 countries have a national cycling strategy, 7 countries have a strategy similar to a national cycling strategy, 4 countries used to have a national cycling strategy that has expired and needs updating, 8 countries are developing their first national cycling strategy, while 21 countries have neither a cycling strategy nor any similar document in place in 2023. “A national cycling strategy (NCS) is a multi-year plan that establishes a global vision aimed at coordinating policies, objectives and actions for cycling” (ECF). This means a document that brings together all national policies that support cycling, thereby sending a political signal that cycling is important and needs to be systematically supported by public authorities, businesses, academia and civil society organisations. One of the common priorities is investment in cycling tourism to boost the tourism sector or divert tourism away from overcrowded areas to lesser-known ones. (ECF 2023) A few examples of promoting inter-modality as part of an NCSs are the following:

Germany

Supporting the expansion of Bike & Ride facilities at railway stations; improving the integration of cycling into intermodal services in municipalities; expanding and harmonising

bicycle transport offers, by broadening the opportunities for bicycles on long-distance trains and making the stations barrier-free. Public bicycle rental systems will be linked to each other by fare systems and digitally to local and long-distance public transport.

Italy

Increasing the possibility to carry bicycles on public transport, especially trains; designated bicycle rails along the flights of stairs of the access paths to the platforms; bicycle sharing stations near public transportation stops; construction of covered and guarded shelters for bicycles at 50% of public transportation stations.

The Netherlands

Improving the link between the bicycle network and public transport by renovating or constructing additional bicycle-parking facilities at railway stations; encouraging and expanding parking facilities for bicycles and (shared) bicycles supply at public transport hubs; providing knowledge and expertise to boost the availability of services at public transport hubs.

Portugal

Reviewing the possibility of transporting bicycles outside heavy passenger transport vehicles; making bicycle transportation practical and accessible by rail, river and, in justified situations, by road; encouraging cycling for inter-urban and urban travel, with adequate bicycle parking.

Spain

Working hand-in-hand with the Spanish Railways Foundation to improve bicycle-rail inter-modality, thus creating safer access to stations and bicycle parking lots.

England

Ensuring that railways cater to cyclists by investing substantial sums on safe cycling routes to stations, particularly in commuter towns; increasing cycle storage at stations, where it is currently limited, reversing the negative trend of reduced bicycle carriage on trains and buses.

Northern Ireland

Fully integrating the bicycle into the wider transport infrastructure, linking it with other modes of transport; integrating cycling routes and infrastructure into transport hubs, bus and rail stations, as well as major bus stops and Park & Ride sites; improving bicycle parking and

carriage; creating a more cohesive network to make Northern Ireland a more popular cycle tourism destination.

Bicycle tourists bring some economic benefits to regions not typically visited by mainstream tourists, a fact that highlights the financial benefits of cycling tourism. This has led the European Parliament to include cycling, tourism and EuroVelo infrastructure in the TEN-T network, opening up opportunities for additional EU funding.

1.5.3 Facts on rail (in) tourism

European urban areas, which constitute the "'engine' of economic growth and development in a territory" generate about 85% of the EU's GDP (European Commission 2014). However, they face challenges such as congestion, safety, air and noise pollution, mostly due to extensive transport activities. Sustainable transport systems are essential to address social development, social exclusion and accessibility (especially for the people with reduced mobility) issues, as European urban centers are expected to contain more than 80% of the population by 2050 from 73% in 2010 (Borghetti, Longo, Mazzoncini, Somaschini, Cesarini, Contestabile 2021). Borghetti et al. carry the 15-Minute-City concept to 15 minutes from a railway station. Created by Carlos Moreno, the 15-minute city concept focuses on reducing commuting time and its associated environmental and economic impacts by ensuring that residents can access essential services within a 15-minute walking or cycling radius. By giving priority to rail transport as a low-emission alternative to car and air travel, cities can address key environmental, social and health concerns, including the reduction of carbon emissions and the reduction of air and noise pollution. Rail transport can be efficiently integrated with other modes of transport and can support the '15 minute city' by improving accessibility for all, including cyclists and people with reduced mobility. It focuses on optimal population densities, mixed neighbourhoods, cultural diversity and using digital tools to improve services, such as bicycle-sharing and online shopping. Cities can create more sustainable, efficient and inclusive urban environments by integrating these elements and potentially extending the principles outwards through rail infrastructure and cycling tourism.

The importance of using a sustainable mode of transportation is becoming an increasingly obvious realisation among both commuters and tourists, due to the environmental, social and health concerns. Rail transport is able to satisfy these concerns and the demand they generate

is one fell swoop. Trains produce much lower carbon emissions compared to cars and planes, thus reducing transportation's carbon footprint. Compared to cars and planes, trains consume less fuel per passenger kilometre. A single track can carry more passengers and goods than a road of the same length; that means less cars, less traffic on the streets and, significantly, no need for big road infrastructure. Less air and noise pollution are other advantages of trains, compared to cars and aeroplane. At the same, time railways require less maintenance compared to roads and motorways; they can also be integrated easily with other modes of transport, leading an even more sustainable alternative. (Ritchie 2023)

Many cycling tourists demonstrate an interest in combining their ride with public transport or any other modes of transport when need be. Since cyclists find using their own bicycles optimal, especially on longer trips (instead of rental ones) the smooth integration between modes is important. Combining train journeys with scenic routes increases the demand for travelling by train as a car-free way to travel. Despite these benefits, trains account for a much smaller number of trips compared to cars. This may be explained by a variety of impediments, such as the existence, in the various EU countries, of different regulations regarding the transportation of bicycle by train. Another issue is the possibility (and difficulty) of changing trains, made even more challenging as the regulations allowing the transportation of bicycles by railway are not uniform, even within the same country, but may differ according to the type of the train involved: local, regional or long-distance ones (Peeters et al. 2009) and from one region to the other in the same country. Such regulations are still the rule rather than the exception, despite the fact that cycling to a train station and loading the bicycle on board is far more efficient, cheap and environmentally friendly than packaging the bicycle at home and transporting it to a station – or, worse, an airport.

Railways have historically been at the heart of tourism development, with Thomas Cook being a pioneer in the use of railways as a means of travel, "also publishing tourist guides describing trips based on the railway" (Papamichail 2019 p.7). Railway tourism now includes dedicated tourist lines and routes that offer a combined travel and leisure experience, such as the Albula Bernina Railway, and the Furka Bahn, both in Switzerland, or the Semmering Railway, in Austria, to quote but a few. This type of tourism may comprise either exclusively tourist routes or mixed-use ones, often integrated with other modes of transport and services such as buses, boats and bicycles. Successful rail tourism requires strong public-private coordination, as

exemplified by Switzerland's 'Grand Tour' package linking major destinations "i.e. ski resorts along a unique landscape" (Papamichail 2019 p.7).

Tourism-oriented railway development combines railway infrastructure with tourism in order to attract and serve different types of tourists by linking leisure activities, cultural sites and scenic landscapes or by showcasing the unique features of the railway. Switzerland is an example of this with the Grand Tour, a 1,600 km route that integrates natural landscapes, cultural sites, sports, gastronomy, architecture and major cities, appealing to different types of tourists. It integrates other modes of transport and offers flexible travel options. In particular, the Gotthard Panorama Express links Lake Lucerne with several towns, even including a boat trip. The Grand Tour also uses the historic mountain route over Gotthard as a tourist attraction, rather than abandoning it, after the base tunnel's opening (Papamichail 2019).

The development of railways for tourism is widespread in Europe and beyond and combines scenic routes with cultural and leisure activities. These railways integrate tourism with transport, enhancing both the travel experience and regional accessibility. The development of tourism-oriented railways relies on two key principles: first, the tourist lines must be connected to the main railway lines and, second, they must be treated just like the main lines, even if they use metric gauge systems.

Supported by other modes of public transport, these railways connect important tourist destinations and cross unique landscapes. They improve access to tourist hotspots, reduce traffic congestion in areas with limited road capacity (e.g. Saint-Moritz, Cinque Terre), protect and showcase landscapes (e.g. UNESCO sites), involve and support local communities through tourism activities (e.g. gastronomy, hiking) and offer a distinctive 'slow' travel experience (e.g. dining cars, scenic carriages). In this way, these railways promote a variety of synergies between functions, activities and social groups (Papamichail 2019).

As a part of a series of climate and environmental measures; aiming to reduce carbon emissions and promote sustainability, in 2021, France banned domestic airline flights on routes that can be travelled by direct train in less than two and a half hours. The measure is in line with France's broader environmental goals under the Paris Agreement, which aims to reduce greenhouse gas emissions by 40 per cent by 2030, compared to 1990 levels. France hopes to reduce the carbon footprint of the aviation sector and promote more sustainable modes of transport by prioritising

rail travel, which is significantly less polluting than air travel. This initiative not only underlines the continent's commitment to tackling climate change through practical policy changes, but it also reflects a growing trend in Europe to favour trains over planes for short journeys. In 2022, The European Commission approved France's plan to ban short-haul flights if there is a good alternative by rail: Paris-Orly to Bordeaux, Nantes and Lyon are the three routes (out of a proposed eight ones) where this applied, effective from May 2023. The Commission says that the ban can only take place if there are real rail alternatives available for the same route - in other words, there must be several direct services in each direction every day, while the speed and quality of the service are also taken into consideration. To these, three more routes could be added from Paris-Charles de Gaulleto Lyon and Rennes, and between Lyon and Marseille. A news by Eccles (2022) reported that the EU executive declared that France was justified to introduce the measure provided it is non-discriminatory, does not distort competition between air carriers and is not more restrictive than necessary to relieve the problem.

New high-speed rail lines will make many short-haul flights across Europe unnecessary, according to planners and politicians. At the moment, it takes more than seven hours to travel by train from Milan in Italy to Paris in France, but with the opening of the 36-mile Mont Cenis base tunnel, which is currently being built under the Savoy Alps, that journey time will be cut in half. In a study by Reid (2023), "According to EU statistics, 17 of the 20 busiest air routes in Europe cover distances of less than 434 miles (698 km), the sort of distances where intercity trains can offer faster, cleaner and more sustainable journeys."

Not just governments, but civil initiatives also take responsibility and create new train route alternatives in Europe. The resurgence of sleeper trains in Europe is having a significant impact on initiatives to make travelling more sustainable and eco-friendly. Long-distance train services are being revitalised across the continent by companies such as European Sleeper, the Nightjet and others. For example, European Sleeper's new cross-border routes connect major cities such as Brussels, Berlin and Prague. They offer an environmentally friendly alternative to short-haul flights, which have a much higher carbon footprint.

1.5.4 Integrating rail and cycling

As shown above, the use of public transport by cyclists is more frequent than by other kinds of tourists. This trend is partly due to the nature of cycling, which tends to involve travelling from

one point to another, rather than returning to the same destination. The sustainability of cycling tourism is greatly enhanced by this practice. However, if the modal split shifts from public transport to cars and airplanes, the environmental benefits of cycling would decrease significantly.

Research by Lumsdon et al. (2009) on travel to cycling destinations in France, Germany, UK and Spain provides important insights into the modes of transport used by bicycle tourists. It highlights the main trends and patterns observed in these regions, with a particular focus on the use of sustainable transport modes. The vast majority of day-trippers set off by bike directly from their home or from their holiday accommodation. In Spain, for example, abandoned railway lines have been converted for cycling and walking. Similarly, 65% of day excursionists in Germany cycle from home, and in northeast England, over 80% of users accessed EuroVelo 12 directly from their home or holiday accommodation. Cycling tourism tends to be less dependent on car and air travel than other types of holidays. The Austrian, German and Swiss markets also show a preference for sustainable transport, while a study of the North Sea Cycle Route in north-east England found high use of trains and ferries to access the route. German cycle tourists tend to start excursions from home, which reduces the need for cars and planes. In Germany, the share of rail transport for cycle holidays is three times higher than for general holidays, car use is 30% lower and air transport 75% lower. Dutch cycle tourists show a low use of air transport but a higher use of cars, especially if they use their bicycle a lot during their holidays. Depending on the route and accessibility, the preferred mode of transport varies considerably. For instance, the Elbe Cycle Route sees a significant number of train journeys, whereas Lower Austria does not. In the Netherlands, the use of the bicycle to access long-distance routes varies between 37% and 76%. In Switzerland, 82-83% of combined overnight and day trips are made by sustainable modes. However, in the UK, particularly in Scotland, there is a high dependency on the car (75-80%) to access cycling destinations. This is partly attributed to the popularity of mountain biking. However, other studies in the UK show higher figures for access by bicycle, by train and by public transport. The literature shows that cycling tourists in different European countries show a strong preference for sustainable transport, although regional differences exist. Promoting cycling as an accessible and environmentally friendly travel option requires understanding and addressing these regional nuances to further reduce the reliance on cars and air travel (Lumsdon et al. 2009).

The report (Lumsdon et al. 2009) addresses the situation regarding railways and their role in sustainable cycling tourism. It highlights that bicycle tourists prefer to use trains or coaches for holidays, significantly reducing CO_2 emissions. For example, in Lower Austria, 73% of surveyed cycle tourists expressed interest in products that combine cycling with public transportation. The integration of different modes of transport is of crucial importance for holiday cyclists, who often prefer to take their own bicycle with them, rather than renting one at their destination. Despite this preference, the transportation of bicycles on trains remains problematic, due to different regulations and approaches by train operators in different countries. Local trains generally allow bicycles on board, but long-distance ones, especially those that cross national borders, often restrict or prohibit the practice, which hinders the development of cycling tourism. The EU TRP, effective since October 2008, aims to regulate rail passenger rights, including bicycle transportation. However, the regulation includes potential exemptions and limitations, based on rolling stock design, which could negatively impact cycling tourism. Despite these challenges, some positive developments have emerged, such as increased bicycle transportation on the Eurostar and Thalys trains. Overall, the report emphasizes the need for better integration and more consistent regulations in order to support sustainable cycling tourism across Europe.

1.5.4.1 Four best practice cases

UK National Cycle Network (NCN)

The UK National Cycle Network (NCN) is a sustainable transport initiative, designed to create an alternative network for cyclists, walkers, and wheelchair users. Developed by Sustrans, a sustainable transport charity, the NCN comprises traffic-free paths, traffic-calmed roads, and minor roads connecting urban centres to the countryside, throughout the United Kingdom. Sustrans envisions the network as a means to encourage cycling and walking, reduce motor traffic, and address climate change. The NCN, spanning 8,000 km and launched in 2000, serves both as a transportation system and a potential tourism attraction. In urban areas, it promotes utility trips to work or school, while in rural ones, it facilitates recreational trips to the countryside. The network aims to enhance overall tourism offerings.

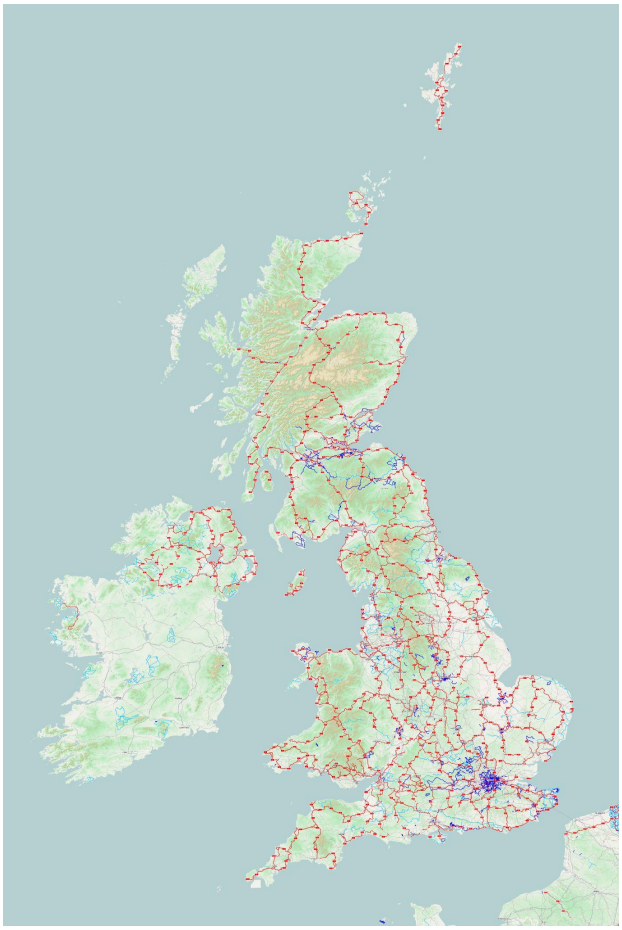


Figure 3: UK National Cycle Network (OpenCycleMap.org 2024)

While the planning of the NCN was based on limited market information, ongoing data collection assesses its attractiveness, usage patterns, and sustainability. Attractiveness shows the demand level the route generates, which is approximately 10-11,000 holiday trips per year, across the Pennines in 1997. By showing us patterns of use, the impact on the local tourism economy in a specific cross section between the towns of Pernith and Consett. The area is observed socially and environmentally, in order to assess the sustainability level of the initiative. The Sea to Sea (C2C) route, surveyed as part of the network, has shown positive impacts on the local tourism economy, with minimal adverse social and environmental effects. Lumsdon discusses earlier segregated recreational cycle routes, emphasising that they, when not integrated into a wider network, tend to attract car-based visitors, raising concerns about sustainable development. It also suggests that routes located in attractive countryside may not significantly contribute to sustainability, if visitors would have used cars regardless of the cycle route's existence.

Lumsdon outlines the principles of sustainable development applied to the NCN, including the reuse of existing resources, reduction of consumption and waste, integration within tourism planning frameworks, maximizing local economic impacts, minimizing local community impacts, promoting diversity, monitoring and management, and appropriate timescales. A model for sustainable tourism transport development is proposed, emphasizing the need to prioritize environmentally sensitive modes of travel, assessing land use against sustainability indicators, providing policy guidance, implementing and continuously monitoring the tourism transport network.

As well as improving people's health and well-being, the NCN brings huge benefits to the UK economy. According to Sustrans in 2022-2023; 4.2 million people made 588 million trips on the Network; 103 million car trips were saved by walking, wheeling or cycling on the Network; 34,000 tonnes of CO_2 saved by walking, wheeling and cycling on the Network; £317 million was saved by the NHS through the Network's impact on people's health. "The Network was made possible by collaborating with a range of different governmental and non-governmental agencies and partners. Such an endeavour is too big for one organisation or even for one sector. It takes nations, regions, and individuals in thousands of communities to create a lasting network that is of such value to so many people." (Brice 2021 p.218)

Green routes, Slovenia

The Green Scheme of Slovenian Tourism (GSST) is a national certification programme, launched in 2015, promoting sustainable tourism practices across the country under the brand Slovenia Green. The scheme is managed by the Slovenian Tourist Board in cooperation with the GoodPlace Sustainable Tourism Factory and Green Destinations Foundation. GSST evaluates destinations and tourism businesses based on their compliance with global sustainability standards, by offering them tools. Today the programme has more than 130 stakeholders, from destinations to service providers. It aims to position Slovenia as a leading green and healthy destination.

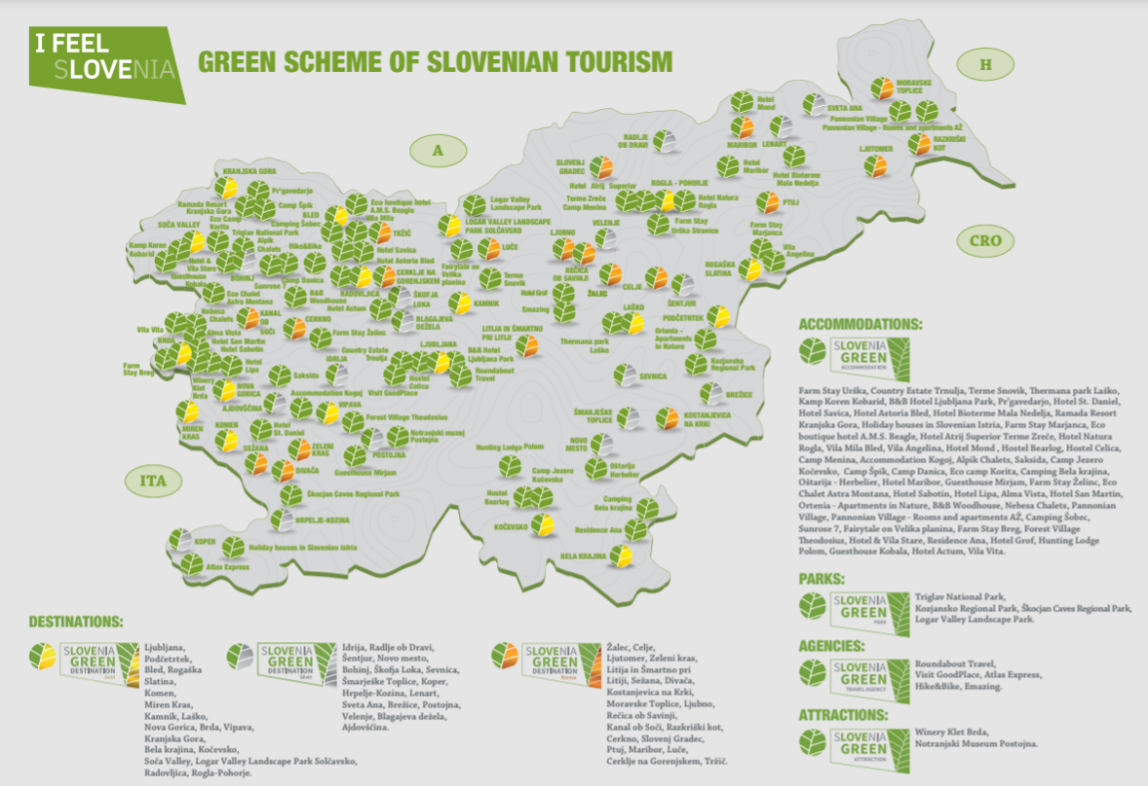


Figure 4: Green Scheme of Slovenian Tourism (Slovenia.info 2024)

Slovenia Green Routes are a network of cycling routes launched in 2019 covering six themes such as gastronomy, wellness and cultural diversity. These routes highlight responsible initiatives for an all-around green escape as they pass through some of the country`s most beautiful corners. In addition to promoting responsible tourism, by linking Slovenia green-certifies businesses that follow strict environmental practices, these themed routes also support the local economy. Each route offers free downloadable information; GPS tracks and services. One of these routes is Slovenia Green Gourmet Route (SGGR), launched in 2020, in which tourists can travel an 861 km itinerary by their bicycles (or could rent bicycles in the destinations and at the train stations) and with the country`s accessible and reliable rail network (Crevar 2024). This synergy between cycling and rail improves access to remote regions, promotes sustainable mobility an contributes to the preservation of Slovenia`s nature and cultural heritage. Crevar quotes a local chef to say on cycling: “Time slows down, you escape your daily obligations, do something good for your health and at the same time experience the culture and traditions of the area you’re passing through.”

Figure 5: Parking places for bicycles at stations of Slovenian railway network (Slovenian Railways 2024)

Another campaign is “By Trains to Historic Towns” which encourages visitors to use trains (and buses) as an eco-friendly and comfortable option instead of their cars, thus helping to keep the environment cleaner. Member museums and institutions offer discounts to those visitors. (Slovenia.info 2024).

Alpine Pearls, Alpine macroregion

Alpine Pearls (AP) was founded in 2006 as a result of two EU projects, Alps Mobility and Alps Mobility II. The focus was creating innovative, sustainable and climate-friendly tourism packages. AP, a transnational umbrella organisation now implements the results of these EU projects. Today there are 18 members in 4 countries, all of them committed to ecotourism, climate protection and sustainable holidays. Their goal is promoting environmentally-friendly mobility means and avoiding the use of private cars as much as possible, by offering guaranteed full mobility alternatives to guests at the destination. They also focus on cross-border tourism management, promote economic development and improve public transport infrastructure for sustainable tourism and mobility through partnerships among municipalities. (AP 2024)

Figure 6: Overview map of Alpine Pearls' municipalities (Alpine Pearls 2024)

Every year, 120 million people visit the region to enjoy its natural beauty and activities like skiing, snowboarding, hiking and cycling. This level of tourism is leading to environmental pressures exacerbated by significant greenhouse gas emissions from transport and accommodation, include overcrowding, pollution, habitat destruction and pressure on local resources such as water and energy (Schellingerhout, 2023). According to the Alpine Convention, some 40% of the Alpine municipalities display significant tourism activity. A 2011 study by Verbeek, Bargeman and Mommaas found that approximately 10% of Alpine villages are tourist destinations whose revenue depends on Alpine tourism. According to the same study, "The European Environment Agency (EEA) estimates that 'up to 80% of all tourist journeys to the Alps, where public transport is crucially lacking, are by car'" (EEA, 2003, p. 86). Further exacerbating the problem is the fact that these cars are not used by their owners merely to get there, but frequently during their holiday as well. A recent study by Cavallaro and Dianin (2020) considers that a high share of private vehicles are still used in the area, more than 84% to reach the destination and move within it. In this context, the mobility of tourists is a key challenge for the Alpine region.

The AP takes measures to reduce the environmental impact of transport (e.g. air pollution due to congestion and greenhouse gas emissions). This can be achieved through improved environmentally friendly transport connections (both to and from the destination and for local/regional transport), shuttle services, the availability of alternative vehicles in communities

and information systems covering all modes of transport and (inter)regional transport services (Verbeek et al. 2011). In particular, by encouraging the use of less polluting means of transport: trains, buses and electric vehicles.

A number of successes are highlighted in the promotion of car-free holidays in the AP. A significant percentage of tourists now choose to travel by train and bus to AP villages such as Werfenweng and Arosa. “Mayor of Werfenweng: 55% of our guests travel here by train and bus. Seven years ago, it was only 6%. Tourism Director, Arosa: About 50% of the tourists in Arosa travel here by train, both in summer and in winter season.” (Verbeek et al. 2011) AP villages offer a wide range of environmentally friendly travel services and activities for their guests, according to the participant’s observation. The “AP Ticket”, valid on all buses and trains in Austria, makes travelling without a car even easier. These comprehensive services make a significant contribution to the creation of a seamless, car-free holiday experience and aim to ensure that tourists are well informed about the green travel options and the opportunities for cycling that are available to them during their stay.

In spite of these successes, the study also identifies challenges that are hindering the full realisation of the AP initiative. Efforts to create seamless cross-border travel options are complicated by the different transport systems and infrastructures in the six different countries of the Alpine region.

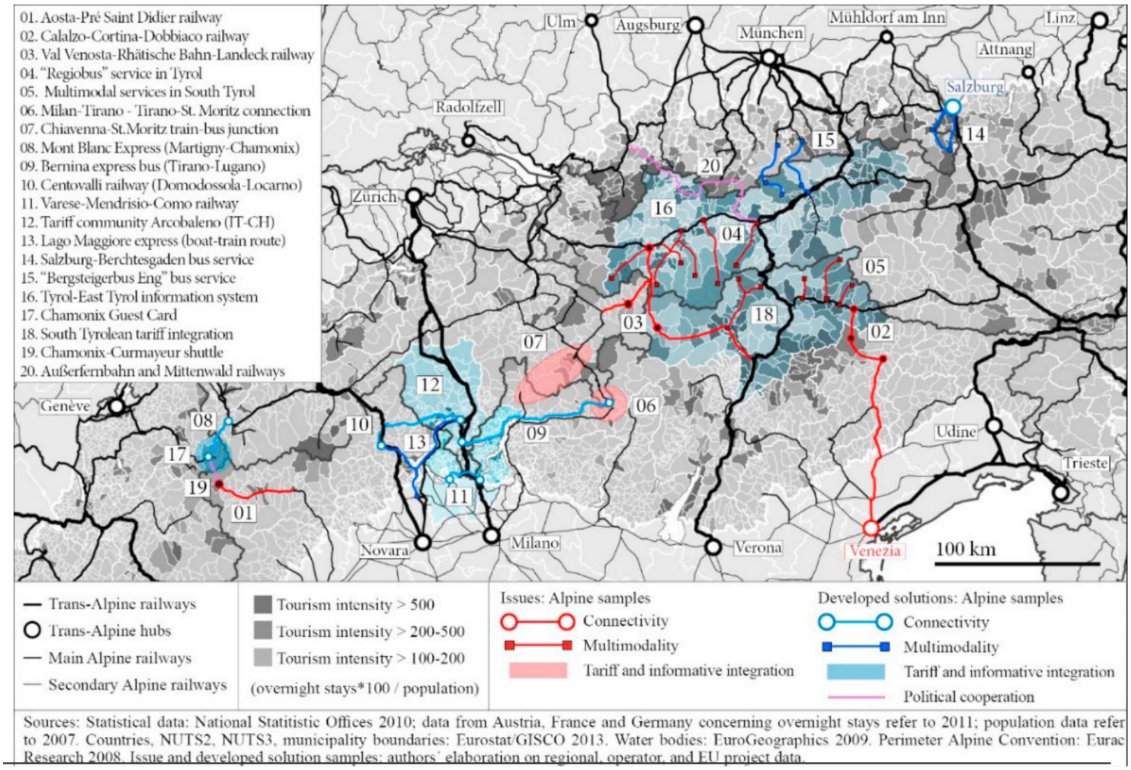


Figure 7: Cross-border issues and solutions in the Alpine arc. (Cavallaro et al. 2020)

Cavallaro et al. (2020) identify challenges to the development of cross-border transport; connectivity, multimodality, integration of tariffs and information and political cooperation. Lack of rail infrastructure, interoperability barriers and uncoordinated schedules are major problems. National policies often major transit lines rather than cross-border or inter-regional connections. While examples like the Mont Blanc Express and the Centovalli Railway show successful cross-border rail connections. Cycling tourism can flourish when there are better connections and more multimodal transport options. Car-free exploration of the Dolomites is possible through initiatives such as the "Trenobus delle Dolomiti" in Veneto demonstrate the potential for promoting sustainable tourism and cycling tourism through cross-border cooperation and strategic infrastructure investments. These and other initiatives mentioned in the study by Cavallaro et al. demonstrate the potential for creating attractive tourist experiences through comprehensive multimodal transport networks. This will ultimately support the growth of cycling tourism in the region.

West Pomerania cycling network (Wschodniosłowiański Szlak Rowerowy), Poland

West Pomerania is a region in northwestern Poland, bordering the Baltic Sea to the north and Germany to the west. In 2014, the region started working on the idea of a regional cycling network; in 2018 the cycling paths of 800km completed and it is expected to completion of four main routes in 2025. “Based around main traffic generators such as cities, train stations and important tourist attractions, four priority corridors were selected for further analysis and detailed development. The choice was related to the degree of current development, touristic attractiveness and the need for socioeconomic activation” (Buczyński 2021).

Figure 8: Western Pomerania regional cycle network (blue lines) with main access points: by long distance (Intercity), regional (Regio) and narrow-gauge (Wąskotorówka) trains (Buczyński, Kolczyńska, Küster 2020).

Key lessons learned from this case are pointed out by Buczyński (2021) as following:

- “Focus efforts and resources on a few carefully selected routes. Completing a continuous high-quality route creates stronger momentum for further development than many isolated sections.
- Regional cycle routes are best built by the regional road administration, as many rural communes do not have capacity for proper tendering or quality assurance. Additionally, regional priorities differ from local ones: an important route connecting two cities can

for example have a 3km stretch passing through the peripheral area of a rural commune that is not really interested in the route. Moreover, tendering at a regional level allows for the benefits of economies of scale.

- Lack of legal tools to facilitate land acquisition for independent cycle tracks. Such tools exist in Poland for road or rail construction but not for cycle routes. A better legal framework would not only speed up implementation but also allow some routes to be built cheaper. Additionally, being able to acquire land further away from a public road could for example reduce the need to incorporate drainage or barriers in the design, elements which are often more expensive than the cycle track itself."

1.5.4.2 SWOT Analysis

Four different case studies are evaluated across Europe. Each of them reflects different regional identities, needs, priorities and all of them showing diverse cycling infrastructures. The UK National Cycling Network and Slovenia Green Routes are examples from two countries at the national scale. Alpine Pearls is an initiative that requires the cross-border collaboration of four countries: Austria, Germany, Italy and Slovenia. The last one is a regional study from Poland, West Pomerania cycling network. All these projects, which started at different times, are still ongoing.

The analysis of best practices through the SWOT framework clearly and comprehensively presents the strengths, weaknesses, opportunities and threats of the case studies in a structured way. The common points become more visible through this structured approach. It can be thought as a benchmarking tool. With the use of this tool and learnings from the best practices, the case study of this thesis can be evaluated in a more systematic and structured way. All these best practices illustrate how cycling networks have been tailored to unique cultures, environmental and social contexts, and all of them contributing to sustainable mobility in their own way.

Table 1: SWOT analysis of UK National Cycling Network

Case study	Aspects	Strengths	Weaknesses	Opportunities	Threats
UK National Cycling Network	Social	**Strong Government and Community Support:** The NCN benefits from robust backing from public authorities and local communities, fostering widespread acceptance and engagement. **Promoting Health and Fitness:** Cycling promotes healthier lifestyles and can reduce healthcare costs.	**Variable Quality of Paths**: Inconsistent path quality can negatively impact user experience and perception. **Weather-Dependent Usage**: Usage and social engagement are significantly affected by adverse weather conditions.	**Integration with Public Transport**: Enhancing connectivity with public transport can improve accessibility and social inclusivity. **Community Programs**: Initiatives like cycling clubs and events can further boost community engagement and social cohesion.	**Environmental Impact of Increased Usage**: High usage might lead to environmental degradation, affecting community quality of life. **Safety Concerns**: Potential for accidents and injuries could deter users and affect social acceptance.
	Economic	**Extensive Coverage:** The broad geographical coverage maximizes user base and economic benefits from increased tourism and local spending. **Tourism Revenue**: Cycling tourism can boost local economies, especially in rural areas.	**High Maintenance Costs:** Ongoing costs to keep paths in good condition can strain budgets. **Weather-Dependent Usage**: Lower usage during adverse weather can reduce economic benefits.	**Expansion of Routes:** Developing new routes can attract more users and generate additional revenue. **Job Creation**: Infrastructure projects and maintenance can create employment opportunities.	**Funding Cuts:** Reduced financial support can impact maintenance and expansion efforts, affecting economic viability. **Competition from Other Modes of Transport**: Alternatives like cars or public transit may reduce economic impact if not adequately addressed.
	Environmental	**Eco-Friendly Transport:** Cycling is a sustainable mode of transport that reduces carbon emissions. **Promotes Green Spaces:** Encourages the preservation and enhancement of natural landscapes along routes.	**Environmental Impact of Infrastructure:** Building and maintaining paths can have negative environmental impacts. **Potential Wildlife Disruption:** Increased human activity could disturb local wildlife habitats.	**Environmental Awareness:** Promoting cycling can increase awareness and support for environmental conservation. **Sustainable Practices:** Implementation of eco-friendly materials and methods in path construction and maintenance.	**Environmental Degradation from Overuse:** High traffic on popular routes could lead to erosion and other forms of environmental damage. **Climate Change:** Extreme weather events could damage infrastructure and reduce usability.
	Technical & Infrastrucrural	**Advanced Infrastructure:** Investment in high-quality cycling infrastructure can enhance user experience. **Technological Integration**: Use of apps and online platforms for route planning and user feedback.	**Maintenance Challenges:** Keeping infrastructure up-to-date and in good condition can be technically challenging and costly. **Varying Standards**: Differences in technical standards across regions can lead to inconsistent quality.	**Smart Technology:** Integration of smart technology for monitoring and maintenance can improve efficiency. **Data Collection:** Using data analytics to optimize route planning and maintenance schedules.	**Rapid Technological Changes**: Keeping up with advancements can be costly and require continuous investment. **Cybersecurity Risks**: Potential threats to digital platforms used for route planning and user data collection.
	Political & Planning	**Policy Support**: Cycling often enjoys strong policy support due to its environmental and health benefits. **Public Funding**: Availability of government grants and subsidies for infrastructure development.	**Bureaucratic Delays:** Policy implementation can be slow due to bureaucratic processes. **Political Shifts:** Changes in government or policy priorities can affect funding and support.	**Advocacy:** Strong advocacy efforts can lead to increased political support and funding. **Legislation:** Implementation of favorable laws and policies to promote cycling and infrastructure development.	**Funding Cuts**: Economic downturns or shifts in political priorities can lead to reduced funding. **Regulatory Challenges**: Stricter regulations on land use and environmental impact could complicate expansion efforts.
	Cultural	**Cultural Acceptance**: Growing cultural acceptance of cycling as a healthy and eco-friendly mode of transport. **Community Events:** Cycling events and festivals can foster a strong cycling culture.	**Cultural Resistance:** In some areas, there may be resistance to cycling due to cultural norms or preferences for other modes of transport. **Safety Concerns**: Cultural perceptions of cycling safety can influence usage rates.	**Promotion and Education**: Campaigns to promote the cultural and health benefits of cycling. **Inclusion in School Curricula**: Integrating cycling education in schools can foster a cycling culture from a young age.	**Competing Interests:** Other recreational or transportation priorities may overshadow cycling. **Cultural Shifts:** Changes in cultural attitudes towards cycling could affect long-term usage rates.
	Operational	**Established Network:** The NCN has a well-established and recognizable network that users trust. **Operational Efficiency:** Effective management and maintenance practices ensure reliable infrastructure.	**Resource Intensive**: High operational demands in terms of maintenance, monitoring, and staffing. **Inconsistent Standards**: Variability in operational standards across different regions.	**Public-Private Partnerships:** Collaborations with private entities can enhance operational capacity and funding. **Volunteer Programs**: Engaging local communities in volunteer maintenance and monitoring efforts.	**Operational Disruptions**: Natural disasters or other disruptions can impact network operations. **Resource Constraints**: Limited resources can strain operational efficiency and effectiveness.

Table 2: SWOT analysis of Alpine Pearls

Case study	Aspects	Strengths	Weaknesses	Opportunities	Threats
Alpine Pearls	Social	**Sustainable Tourism Model**: Promotes eco-friendly practices, appealing to environmentally conscious tourists. **Beautiful Scenic Routes:** Enhances the quality of the travel experience, contributing to community pride and attraction.	**Limited to Specific Regions**: Restricts social impact to certain areas, potentially excluding broader engagement. **Seasonal Tourism**: Limits social benefits to certain times of the year.	**Increasing Demand for Eco-Tourism**: Capitalize on growing interest in sustainable travel, improving social and environmental outcomes. **Partnerships with Local Businesses**: Can enhance local community engagement and support.	**Climate Change Impact**: Affects the environment and tourism viability, influencing local social and economic stability. **Regulatory Changes:** New regulations could impact how the tourism model operates, affecting community benefits.
	Economic	**Strong Brand Recognition**: Boosts economic opportunities through increased tourism and higher spending. **Beautiful Scenic Routes**: Enhances appeal, potentially leading to higher economic returns.	**High Operational Costs**: Expensive to maintain and operate, impacting financial sustainability. **Seasonal Tourism**: Limits revenue generation to peak times.	**Expansion to Other Alpine Regions**: Can increase economic impact and diversify revenue streams. **Partnerships with Local Businesses**: Provides additional economic benefits and local support.	**Climate Change Impact:** Can affect tourism flows and operational costs. **Competition from Other Tourist Destinations**: May reduce the economic benefits if other locations offer similar experiences.
	Environmental	**Eco-Friendly Practices:** Strong focus on sustainability reduces environmental impact. **Conservation Effort**s: Helps preserve natural landscapes and biodiversity.	**Environmental Sensitivity**: Alpine regions are ecologically sensitive and may be easily impacted by tourism.	**Promotion of Green Tourism**: Encourage practices that further reduce the environmental footprint of tourism activities. **Climate Change Mitigation**: Implementing measures to combat climate change can enhance sustainability.	**Environmental Degradation**: Increased tourism can lead to erosion, waste, and habitat disruption. **Climate Change**: Altered weather patterns and melting glaciers can affect the attractiveness and accessibility of Alpine regions.
	Technical & Infrastrucrural	**Advanced Infrastructure**: High-quality facilities and routes enhance the tourist experience. **Technology Integration:** Use of digital tools for booking, navigation, and information dissemination.	**Maintenance Challenges**: Keeping infrastructure up-to-date and in good condition can be technically demanding and costly.	**Smart Tourism Solutions:** Implementing smart technology can improve efficiency and user experience. **Renewable Energy**: Utilizing renewable energy sources for facilities can enhance sustainability.	**Technological Obsolescence**: Rapid advancements in technology can render current systems outdated quickly. **Cybersecurity Risks:** Potential threats to digital platforms used for tourism management.
	table 2	**Policy Support:** Favorable policies for sustainable tourism support Alpine Pearls' initiatives. **Cross-Border Cooperation**: Collaboration among Alpine countries enhances tourism potential.	**Regulatory Complexity**: Navigating different regulations across regions can be challenging.	**Advocacy for Sustainable Tourism Policies:** Strong lobbying can lead to more supportive legislation. **International Agreements:** Participating in international agreements on sustainability can bolster support.	**Policy Changes**: Shifts in government priorities could reduce support for sustainable tourism. **Funding Cuts:** Economic downturns could lead to reduced government funding.
	Cultural	**Rich Cultural Heritage**: Promotes the unique cultural aspects of Alpine regions. **Community Engagement**: High level of local involvement and pride in the tourism model.	**Cultural Resistance**: In some areas, there may be resistance to changes brought by increased tourism.	**Cultural Tourism:** Promoting local traditions, crafts, and events can attract tourists. **Educational Programs:** Raising awareness about the cultural and environmental significance of the Alps.	**Cultural Erosion**: Increased tourism can lead to the dilution of local cultures. **Competing Interests:** Balancing tourism with the preservation of cultural heritage can be challenging.
	Operational	**Established Network**: A well-established and recognizable network that users trust. **Operational Efficiency:** Effective management and maintenance practices ensure reliable infrastructure.	**Resource Intensive:** High operational demands in terms of maintenance, monitoring, and staffing. **Inconsistent Standards:** Variability in operational standards across different regions.	**Public-Private Partnerships**: Collaborations with private entities can enhance operational capacity and funding. **Volunteer Programs:** Engaging local communities in volunteer maintenance and monitoring efforts.	**Operational Disruptions:** Natural disasters or other disruptions can impact network operations. **Resource Constraints**: Limited resources can strain operational efficiency and effectiveness.

Table 3: SWOT analysis of Slovenia Green Routes

Case study	Aspects	Strengths	Weaknesses	Opportunities	Threats
Slovenia Green Routes	Social	**Accessiblet:** The country wide routes are suitable for locals, as well as tourists. **Promoting Health and Fitness:** Cycling promotes healthier lifestyles and can reduce healthcare costs.	**Variable Quality of Paths**: Inconsistent path quality can negatively impact user experience and perception.	**Integration with Public Transport**: Enhancing connectivity with public transport can improve accessibility and social inclusivity. **Community Programs**: Initiatives like cycling clubs and events can further boost community engagement and social cohesion.	**Cultural Resistance to Cycling**: Some rural populations may resist efforts to promote cycling over traditional car use, especially where public transport options are limited.
	Economic	**Boosting rural businesses:** Cyclists are attracted to least visited areas **Tourism Revenue**: Slovenia's nature and aim for being a sustainable destination can create a source for the local economy.	**High Maintenance Costs:** Ongoing costs to keep paths in good condition can strain budgets. **Weather-Dependent Usage**: Lower usage during adverse weather can reduce economic benefits.	**Demand on eco-tourism routes:** Sustainable and eco-friendly tourism grows so the revenue. **Job Creation at Local Level**: Encouraging local businesses fto cater for cyclists create employment.	**Competition from Other Destination**s: Neighboring countries, particularly Austria and Italy, have well-developed cycling networks and could attract tourists who might otherwise choose Slovenia.
	Environmental	**Eco-Friendly Transport:** Cycling is a sustainable mode of transport that reduces carbon emissions. **Promotes Green Spaces:** Encourages the preservation and enhancement of natural landscapes along routes.	**Environmental Impact of overuse in some areas:** Popular areas should be managed carefully. **Potential Wildlife Disruption:** Increased human activity could disturb local wildlife habitats.	**Environmental Awareness:** Promoting cycling can increase awareness and support for environmental conservation. **Sustainable Practices:** Implementation of eco-friendly materials and methods in path construction and maintenance.	**Environmental Degradation from Overuse:** High traffic on popular routes could lead to erosion and other forms of environmental damage. **Climate Change:** Extreme weather events could damage infrastructure and reduce usability.
	Technical & Infrastrucrural	**Advanced Infrastructure:** Investment in high-quality cycling infrastructure can enhance user experience with scenic routes. I**ntegration with national parks**: Network is built aligned with Slovenia's natural attractions.	**Maintenance Challenges:** Keeping infrastructure up-to-date and in good condition can be technically challenging and costly. **Varying Standards**: Differences in technical standards across regions can lead to inconsistent quality.	**Smart Technology:** Integration of smart technology for monitoring and maintenance can improve efficiency.	**Rapid Technological Changes**: Keeping up with advancements can be costly and require continuous investment. **Lack of Investment in Rural Area**s: Inadequate investment in rural or less-popular routes could result in a fragmented network, reducing overall network cohesion and usability.
	Political & Planning	**Policy Support for sustainability**: Slovenia's strategy is to position itself as a sustainable tourism brand in Europe. EU **Fundings**: EU has many funds for SDG related projects.	**Bureaucratic Delays:** Policy implementation can be slow due to bureaucratic processes in different regions. **Political Shifts:** Changes in government or policy priorities can affect funding and support.	**Advocacy:** Strong advocacy efforts can lead to increased political support and funding. **Cross-border collaborations:** Neighbouring countries aslo promote cycling and infrastructure development.	**Shifts in Political Priorities**: Changes in government or shifts in political focus away from sustainability or tourism could slow or halt further development of the cycling network.
	Cultural	**Cultural Heritage**: Cycling aroutes often pass through cultural and historical landmarks **Cycling Events: Tour of Slovenia and other outdoor culture support** cycling.	**Cultural Resistance:** In some areas, there may be resistance to cycling due to cultural norms or preferences for other modes of transport. **Safety Concerns**: Cultural perceptions of cycling safety can influence usage rates.	**Cycling Education**: Campaigns to promote the cultural and health benefits of cycling.	**Competing Interests:** Other recreational or transportation priorities may overshadow cycling. **Cultural Shifts:** Changes in cultural attitudes towards cycling could affect long-term usage rates.
	Operational	**Mild climate:** An extensive season in the seaside areas support cycling **Railway network:** Effective railway infrastructure for different kinds of users.	**Resource Intensive**: High operational demands in terms of maintenance, monitoring, and staffing. **Inconsistent Standards**: Variability in operational standards across different regions.	**Public-Private Partnerships:** Collaborations with private entities can enhance operational capacity and funding.	**Operational Disruptions**: Natural disasters or other disruptions can impact network operations. **Resource Constraints**: Limited resources can strain operational efficiency and effectiveness.

Table 4: SWOT analysis of West Pomerania cycling network

Case study	Aspects	Strengths	Weaknesses	Opportunities	Threats
West Pomerania cycling network	Social	**Promoting Health and Fitness:** Cycling promotes healthier lifestyles and can reduce healthcare costs.	**Lack of Awareness:** Local residents may not fully recognize the health or environmental benefits of cycling. **Safety Concerns**: Cyclists might face road safety risks in rural settings.	**Integration with Public Transport**: Enhancing connectivity with public transport can improve accessibility and social inclusivity. **Community Programs**: Initiatives like cycling clubs and events can further boost community engagement and social cohesion.	**Environmental Impact of Increased Usage**: High usage might lead to environmental degradation, affecting community quality of life. **Safety Concerns**: Potential for accidents and injuries could deter users and affect social acceptance.
	Economic	**Tourism Revenue**: Cycling tourism can boost local economies, especially in rural areas where are less visitied. Could create new destinations.	**Seasonal Dependency**: The influx of tourists is largely seasonal (summer), which may reduce the year-round economic impact of cycling infrastructure.	**Cycling Tourism Development**: Increase marketing efforts to promote West Pomerania as a prime cycling destination, boosting eco-tourism revenue. **Job Creation**: Infrastructure projects and maintenance can create employment opportunities.	**Funding Cuts:** Reduced financial support can impact maintenance and expansion efforts, affecting economic viability. **Competition from Other Modes of Transport**: Alternatives like cars or public transit may reduce economic impact if not adequately addressed.
	Environmental	**Eco-Friendly Transport:** Cycling is a sustainable mode of transport that reduces carbon emissions. **Protects biodeversity:** Encourages the preservation and enhancement of natural landscapes along routes.	**Environmental Impact of Infrastructure:** Building and maintaining paths can have negative environmental impacts. **Potential Wildlife Disruption:** Increased human activity could disturb local wildlife habitats.	**Environmental Awareness:** Promoting cycling can increase awareness and support for environmental conservation. **Sustainable Practices:** Implementation of eco-friendly materials and methods in path construction and maintenance.	**Climate Change:** Extreme weather events could damage infrastructure and reduce usability. **Ecological Disturbances**: Overuse of certain natural areas by tourists could lead to environmental degradation, threatening biodiversity.
	Technical & Infrastrucrural	**Existing Infrastructure**: Many established cycling routes are already in place, especially along the coast, providing a foundation to expand and improve upon.	**Maintenance Challenges:** Keeping infrastructure up-to-date and in good condition can be technically challenging and costly. **Incomplete Network**: Some cycling routes remain fragmented, requiring significant upgrades and expansion to create a cohesive, comprehensive network.	**Expanded EuroVelo Integration**: Further integration with the EuroVelo network could attract international cyclists and foster cross-border cooperation.	**Poor Integration**: Failure to properly integrate cycling routes with other forms of transport (e.g., buses, trains) could reduce the utility and convenience of the network.
	Political & Planning	**EU Fundings**: Access to European Union funds for sustainable transport development. **Local Government Support**: Regional authorities may be supportive of eco-friendly infrastructure initiatives, recognizing the benefits to tourism and sustainability.	**Bureaucratic Delays:** Policy implementation can be slow due to bureaucratic processes. **Political Shifts:** Changes in government or policy priorities can affect funding and support.	**Cross-Border Cooperation**: Cooperation with neighboring countries like Germany to create cross-border cycling routes could promote international tourism and collaboration.	**Funding Cuts**: Economic downturns or shifts in political priorities can lead to reduced funding. **Regulatory Challenges**: Stricter regulations on land use and environmental impact could complicate expansion efforts.
	Cultural	**Outdoor Culture**: Cycling is aligned with the Polish tradition of outdoor activities, especially in coastal and rural areas, promoting active lifestyles and recreational opportunities. **Cross-Border Connectivity**: The region's proximity to Germany allows for cultural exchanges and cross-border cycling tourism.	Cultural Resistance: In some areas, there may be resistance to cycling due to cultural norms or preferences for other modes of transport. Safety Concerns: Cultural perceptions of cycling safety can influence usage rates.	**Eco-Friendly**: Growing global awareness of climate change could push more residents and tourists to choose cycling over car travel. **Local Heritage Promotion**: Incorporating cultural heritage sites into cycling routes can boost interest in local history and traditions.	**Fragmented Cultural Connection**: Poorly designed routes that fail to incorporate local heritage or community interests may not gain widespread public support.
	Operational	**Maintenace:** Effective management and maintenance practices ensure reliable infrastructure and increase accessibility.	**Inconsistent Standards**: Variation in the quality of paths between urban and rural areas, with some routes being poorly maintained or hard to access.	**Public Transport Integration:** Developing seamless integration between cycling infrastructure and public transport (buses, trains) will enhance overall mobility.	**Resource Constraints**: Limited resources can strain operational efficiency and effectiveness. Lack of **Long-Term Planning**: Inadequate long-term planning could result in underuse or mismanagement of resources, especially for maintenance and upgrades.

2. Methodology

2.1 Research design

The research design of this study uses a qualitative approach, with a focus on semi-structured interviews, in order to gather comprehensive insights from different stakeholders involved in the integration of railway infrastructure with cycling tourism in Greece and in Europe, as well as other experts working on sustainability and regional development. In order to understand the opportunities and challenges of such integration, this qualitative approach provides an in-depth exploration of the views, experiences and proposals of those who are involved in related issues.

2.2 Data collection

The data was gathered in two ways: interviews and publications, such as policy papers and academic studies. Two questions were asked when selecting the literature: “What have other authors chosen to discuss between the background and the results? What are the corresponding elements of the project that need to be discussed?” (Gruba and Zobel 2017)

In the selection of the participants, care was taken to ensure that there was a diversity of people from all the defined areas, with a variety of perspectives and knowledge to offer. In order to ensure a balance of perspectives from different regions of Greece and different sectors involved in or affected by the proposed integration, the aim was to interview at least 15 participants, at least 1 participant from each interview group. Unfortunately, it was not possible to conduct interviews with all of them. It was not easy to get in touch with the state officials, and either they could not be reached or response was not positive. The planned interview groups were:

- sustainability experts
- environment and/or ecology professionals
- planners (urban and regional)
- local businesses
- tourism officials (local and governmental)
- tourism agencies, tour operators (cycling, railways and niche markets)
- tourists and residents who are users of both rail and cycling infrastructure
- railway operators (private and government ones from Greece and other countries)
- advocacy groups (cycling organisations, train enthusiasts, local initiatives)
- academia (sustainable tourism, transportation studies, and environmental science)

- policy and decision makers (local municipalities and government officials)
- local community leaders
- transportation (planners, train workers et al.)

Interviews were mostly conducted by videoconference (by means of Zoom, Teams and Skype) depending on the availability and preference of the participants. The duration of each interview ranged from 30 to 60 minutes. All interviews were audio-recorded, with the consent of the participants, to ensure accurate transcription and analysis. The list of final interviewees are:

Alexios Menexiadis, historian, train enthusiast, touring cyclist. Member of Φίλοι του Ποδηλάτου/ Friends of bicycle' cycling club in Athens.

Angela van der Kloof, strategic advisor at Mobycon which creates sustainable transport solutions case-by-case across Europe.

Chris Engelsman, co-founder of European Sleeper, an overnight sleeper train.

Doğan Çelik, director of Innovation For Development (i4d). As an innovation expert, he works on inclusive economic growth, with a special focus on work with vulnerable groups such as women, refugees and youth in the development sector.

Georgios Drakopoulos, founder and CEO of Tourism Generis specialized in lobbying and tourism development. He has worked at UNWTO, EOT, SETE.

Georgios Lialios, environmental journalist at the Kathimerini (a daily newspaper published in Athens since 1919)

Jemima James, destination manager for Greece and Turkey at The Slow Cyclist. The Slow Cyclist organises exceptional cycling and walking tours holidays for curious travellers in Europe and Africa.

Jesper Pørksen, director at Danish Cycling Tourism (also the EuroVelo Coordination Centre)

Konstantinos Athanasopoulos, postdoc Researcher at Sustainable Mobility Unit, National Technical University of Athens (NTUA)

Lefteris Fates, co-founder of Bikewise Travel, Ioannina, Greece

Łukasz Janeczko, policy advisor at Instytut Spraw Obywatelskich (Since 2004, it has initiated campaigns related to sustainable transport, including railways).

Lydia Chatzialexiou, touring cyclist. Member of Φίλοι του Ποδηλάτου/ Friends of bicycle' cycling club in Athens.

Maria Theofanopoulou, travel industry expert. CEO of Greek Travel Pages (GTP). She is and has been member of numerous travel and tourism associations in Greece.

Maria Siti, urban mobility expert in Greece working in SUMPs, accessibility plans, walking (incl. disabled and vulnerable road users' mobility), cycling, public transit policies, electromobility. Member of the Sustainable Mobility Unit, NTUA.

Michael Widmer, Tour operator of Navarino Outdoors, Founder & Director of Exosports.

Nick Fotis, the Greek correspondent for the English-language publishing house Platform 5 (especially for the publication "Today's Railways Europe") for two decades.

Nicolás Cruz González, sustainable mobility expert at the MobiliseYourCity. He worked on sustainable mobility policy in Bogota and environmental actions in transport sector.

Philipp Cerny, a former advisor to Chairman of the EP's Transport and Tourism committee, co-editor the "European Mobility Atlas", former member of the supervisory board of the railway company Erfurter Bahn GmbH.

Pınar Pinzuti, cycling tourism expert at Bikenomist. Organizer of the Cycling Tourism Expo - Fiera del Cicloturismo and a member of the Eurovelo Council.

Spiros Papageorgiou, co-Founder and CEO of "Cities for Cycling", member of the EuroVelo Council and organizer of the first cycling tourism conference in Greece on 12th April 2024.

Stefan Estermann, Ambassador of Switzerland to Greece. Proponent of / Included as an expert of Switzerland's initiative to revitalise the historic narrow-gauge railway in the Peloponnese.

Stefanos Tsigdinos, Postdoctoral Researcher NTUA, Adjunct Lecturer at the University of West Attica.

Stefanos Katsolis, founder and co-owner of the company "XYZ", a design office specializing in topographic works and studies.

Vaggelis Petroulakis, Bike Master at Ibiscos Garden Hotel, Crete

Vanessa C. Perez Miranda, Advisor at the International Union of Railways (UCI)

The interview questions have been developed with a view to ensuring consistency across the interviews, whilst at the same time allowing flexibility for the exploration of specific areas of interest. Such areas include understanding the current state of railway infrastructure and cycling tourism in Greece; their potential integration benefits and opportunities; barriers and challenges of this integration in terms of political, regulatory and social considerations; and more. Getting recommendations for a possible successful integration for regional development is the focus of the interviews.

Interview Questions

- What is your job and your expertise in the context of X?
- How do you define territorial development?
- How does cycling tourism / a railway network contribute to territorial development?
- What is the current state of railways / cycling tourism in Greece?
- How about the integration of them? Benefits and challenges?
- Why do you promote railways instead of car travel? What are the effects of these on smaller local communities?
- What is your role in this cooperation/integration? Which other stakeholders should be involved?
- How do you see the collaboration between stakeholders?
- What is the importance of diverse income sources for a region?
- How do you define slow tourism?
- The definition of slow tourism is …. Could you please react to this statement?
- What do you think about multi-modality or the need to combine different means of travel in slow tourism? Advantages and disadvantages?
- What could be some strategies for the integration of trains and bicycles for better tourist experiences?
- Why is slow tourism needed at a regional level?

- What is the impact of railway transportation for people and goods for the local, residents / for the outsiders?
- Could you give examples from related areas from your past experiences?
- How should local communities be involved in the planning and implementation of the regional projects?
- What were the challenges? Political, environmental, infrastructural. mindsets etc?
- Do you have any ideas, plans or projects for this area?
- Do you think there are enough investments for territorial development, railway networks and bicycle tourism?
- How can the impact be measured?

2.3 Data analysis

A careful examination of the data collected from the interviews is part of the data analysis in this study. It aims to identify patterns, themes and findings which are related to the research questions. The process of interview data analysis involves several steps: transcription, theme identification and interpretation. Transcription of the interviews was the first step in the data analysis process. After transcription, the next step was identifying themes (i.e. patterns or trends emerging from the key concepts). Similar concepts were grouped together and each group of related concepts was subsequently grouped under one theme such as accessibility, supporting local economies, open minded stakeholders, car lobby and so on. The themes were defined in such a way as to accurately reflect the underlying patterns in the data. The themes are grouped in the findings section as economic, social, environmental, technical and infrastructural, political and planning, cultural and operational. The themes were reviewed and refined to ensure that they were clear and comprehensive. This involved a re-examination of the data to verify that the themes were grounded in the participants' responses. The final step in the analysis of the data was the interpretation of the themes. The interpretation process involves explaining the meaning of the themes in terms of the topic and in relation to the research question and the theoretical framework. This process began with the contextualisation of the themes. The themes were placed in the context of the research question in order to explain the relevance and implications of the themes.

The findings were compared with the existing literature, in order to identify areas of agreement and disagreement. This helped to place this study in the context of the wider academic

discourse. On the basis of the themes, insights were developed in relation to the research question. These insights were supported by direct quotes from the interview transcripts. These were used to provide evidence and illustrate the findings. In order to ensure the credibility and reliability of the results, triangulation is used as a validation technique. To corroborate the findings, data from the interviews were triangulated with other data sources, such as policy documents, newspaper articles, other interviewees and observations. To ensure the accuracy and reliability of the analysis, the analysis process and findings were reviewed by experts in the field. In order to gain deep insights from the interview data, the data analysis process was thorough and systematically. By transcribing, identifying themes and interpreting, the study was able to address the research questions and contribute to understanding the research problem. The findings from this analysis are presented in detail in the findings chapter.

2.4 Case study approach

Greece in general and in particular the Peloponnese region was chosen as the case study. Although Greece is famous for its beaches, which attract a steady influx of summer holidaymakers, the country also offers a diverse (although much less known) geographical landscape of inland rural areas for its historical sites, cultural heritage and natural beauty. This diversity provides a rich context for studying the integration of rail infrastructure with cycling tourism in different settings. The differences in topography and climate also present opportunities and challenges for sustainable territorial development in a country where almost half of the population is concentrated in a single metropolitan area. Integrating rail infrastructure with cycling tourism fits with efforts to promote sustainable tourism, while preserving cultural and environmental assets. Studying Greece provides an opportunity to learn how sustainable transport may enhance the tourist experience and help support the local economy, as well as enriching the lives of local residents. In recent years, Greece has experienced significant problems in terms of transportation, in part due to calamities such as train accidents, floods and wildfires. Improving the country's transport infrastructure, by investing not just in motorways but also in more sustainable modes of transportation, such as railways and cycling networks, could potentially provide solutions to some of these problems. Such improvements would involve upgrading and modernising the railway lines; adjusting them to current needs and demands; creating and expanding cycling routes; connecting these two sustainable modes of transport in an integrated, accessible whole. Examining these initiatives offers useful insights into infrastructure planning, investment strategy and the role

of public policy in promoting sustainable transport options. Like many countries, Greece faces environmental sustainability and economic development challenges. The integration of the railway infrastructure with cycling tourism is in line with the wider objectives of reducing carbon emissions, promoting environmentally friendly modes of transport and diversifying the country's range of tourist options beyond the traditional coastal resorts. It is this researcher's view that Greece, although an EU country on paper, is actually rather more of a Mediterranean, Near-Eastern country, both at heart and in daily life practices. The study of Greece provides an examination of the policy framework, stakeholder collaboration and community engagement efforts, in relation to sustainable transport. Involving government departments, municipalities and stakeholders will help to understand how complex it is to plan integrated transport solutions and overcome barriers to their implementation. A unique opportunity to explore different geographical settings, cultural landscapes and policy contexts is provided by the choice of Greece as a case study for exploring the integration of railway infrastructure with cycling tourism. This could enable a comprehensive analysis of how sustainable transport initiatives can contribute to economic development, environmental protection and enhanced tourism enjoyment, especially in a country which combines serious challenges, as well as great potential for using these two modes of sustainable transport. The results of this research may be used as a basis for policy recommendations, infrastructure planning and community engagement strategies for the promotion of sustainable mobility and tourism in Greece and beyond.

3. Introduction to the case study: Greece

According to the European Union, Greece is the 9th largest country in terms of size, the 12th in terms of population and the 25th in terms of standard of living among the 27 EU member states (Eurostat 2024, 2022). Greece is a country with an economy reliant on tourism and shipping: in 2022, about 3.76 per cent of the GDP of Greece came from agriculture, 16.82 per cent from industry and 67.35 per cent from the services sector (Statista 2024). According to the OECD, tourism is one of the main driving forces of the Greek economy. The impact of COVID-19 was a 44.8% decline in tourism gross value added (GVA) to €6.4 billion in 2020, with a direct contribution to the national economy of 4.4%. Tourism, which accounts for 20% of Greece's GDP, is included in the services sector and obviously, it is of great importance to the Greek economy. However, it is mostly the islands, sea resorts and large cities (such as Athens and Thessaloniki) that are promoted and reap the lion's share of profits (and problems). According to global projections (Greek Current 2023), while tourism is expected to grow by 20% worldwide, in Greece this increase is expected to reach a stunning 70%! Naturally, such an increase will stretch the already limited resources of the most popular destinations beyond their current capacity. A remedy would be to spread the expected influx more evenly across the country, by promoting less known destinations. Another would be to promote more sustainable tourism options. Despite the fact that cars are still the dominant mode of transport in continental Greece, currently, there is no lack of opportunities for sustainable tourism, including rail and cycling options. Considering all these pieces of information, a sustainable tourism agenda could be a win for the residents, the nature and the economy; promoting a combination of rail and cycling could help implement this agenda.

Demographic changes in Greece since 1950, influenced by postwar economic and social development, have significantly affected population size, age structure and spatial distribution. More than half of Greece's population is concentrated in just 2.9% of the country's area. Currently, 76% of the population lives in urban centres while 50% of the country's 11 million live in the two largest metropolitan cities, Athens and Thessaloniki (Heinrich Böll Foundation Greece 2022). The trend of integral migration from rural to urban areas has slowed to a trickle without having completely halted. Reversing this concentration remains a tremendous challenge. Since the economic crisis of 2010, Greece is experiencing a new wave of emigration, as its younger and better educated members seek opportunities abroad, reversing previous

trends of remittances and economic migration, a trend which has resulted in a negative migration balance and accelerating demographic decline (and aging). The health system suffers from low public investment, geographical imbalances and high private spending. Since 2010, deaths have outnumbered births, particularly in many rural municipalities, leading to population decline, which varies from one region to the next. Some metropolitan areas and islands have seen an increase in population, while the mainland and the north of Greece have experienced a sharp decline. Future elderly households are likely to be smaller and more isolated, increasing the need for strong social support systems, as family ties weaken. For sustainable territorial development in Greece, addressing these demographic challenges is crucial. To ensure social, economic and territorial cohesion, policies are needed to attract young people, support families and strengthen health and social systems (Kotzamanis 2023). In order to achieve sustainable territorial development, it is crucial for national and regional planners and decision-makers in Greece to recognise and respond to the demographic trends. If these trends are not addressed, they will become irreversible and will have a significant impact on the social, economic and territorial cohesion of the country. For this reason, it is essential to move from a passive observation to a pro-active approach. This includes mitigating current demographic challenges and implementing strategic policies to reverse negative trends. In this way, Greece can ensure sustainable development that is in line with demographic realities and promotes a balanced and resilient future.

3.1 Cycling, cycling infrastructure and multi-modality in Greece

Until the 1970s, bicycles were common in Greek cities, but increasing prosperity, as well as a car-oriented mentality and sense of freedom and prestige (promoted by the car lobby). As these filled streets which had never been designed with motorised traffic in mind, the safety of pedestrians and public transportation users became a concern. This led to a vicious circle: as cars proliferated, public spaces deteriorated to such an extent, that more people resorted to buying a car, as the safest means of transportation. The problem was exacerbated by the authorities' failure to respond with adequate measures, such as investment in public transit or infrastructure for all road users. More recently, efforts to reintroduce cycling are aimed at improving the aesthetics of the city, reducing pollution and addressing challenges such as cost, road infrastructure and traffic congestion (Vlastos, Milakis, Athanasopoulos, 2005). Implementing cycling infrastructure is a relatively new concept in Greece. Karditsa, a medium-sized city with a long tradition of cycling, was the first to decide to implement a citywide

network of protected cycle lanes in 2003. This was followed in 2005 by Kordelio, a municipality in the Thessaloniki metropolitan area. However, the latter implementation was unsuccessful because the cycle lanes were not respected by car drivers, who used them for parking (Athanasopoulos, Vlastos 2018). The first major study (Vlastos et al. 2005) on cycling in Greece, commissioned by the Ministry of Transport and carried out by the National Technical University of Athens (NTUA), lasted three years and was completed in 2004. The aim of the study was to investigate the feasibility of the integration of cycling networks in Greek cities. A planning manual adapted to Greek urban conditions was the final product of the study. A full 20 years later, despite a number of new studies, little has been done in the way of implementation.

At present, the existing infrastructure of cycling paths in different Greek towns does not encourage long-distance cycling, mainly because the existing networks are limited to short distances within urban boundaries. Except for a handful of cities with a cycling tradition (such as Karditsa, Trikala and Messolonghi) the main hurdles to cycling in Greece are problems related to the safety and maintenance of cycling paths, as well as the hostile behaviour of car drivers. As a result, there are more routes for mountain biking than touring (Tsitoura et al. 2021).

Table 5: Cycling paths in Greece (Tsitoura, Tsartas, Sarantakou, Kontis, 2021)

Cycle paths in Greece	
Number of municipalities having cycle paths	102
Percentage of municipalities having cycle paths	31% (102/324)
Kilometres of cycle paths (in total)	403.7 km
Mixed-use paths (cars and bikes)	34.8 km
Bike lanes	54.1 km
Bike corridors	305.4 km
Bike path metres per habitant	0.037

In Greece, there are different regulations regarding the transportation of bicycles in different modes of transport. Specific rules and restrictions on the carriage of bicycles have been in place since 2015, while the Greek railway is in line with the provisions of Regulation 1371/2007 of

the European Union, according to which railway undertakings must enable passengers to carry bicycles under specific conditions (Tsitoura et al. 2021). On planes, bicycles are accepted as sports equipment or luggage, depending on each airline's regulations, while on ferries, bicycles can generally be transported free of charge in the car garage. The buses of Hellenic Train accept 1 foldable bicycle per route in a suitable storage case with specific sizes. There is no mention of carrying regular size bicycles.

KTEL is the main operator of regional and intercity buses in Greece. It is a cooperation of 62 regional bus companies, usually named after the regional unit they serve, e.g. KTEL Igoumenitsas for Igoumenitsa. The KTEL companies provide 80% of all passenger transportation in Greece (EuroVelo Greece). Bicycles may be allowed on buses, depending on the space provided and the attitude of the bus driver. Different KTEL companies may have different regulations for bicycles, such as charging extra, having to use boxes, etc. These differences can become a source of problems when travelling by bicycle. On ferries and trains, bicycles can be transported without having to be disassembled and packaged. On many KTEL websites there is no information about the transportation of bicycles, so the problem is usually negotiated at the bus terminal with each bus driver.

3.1.1 Cycling tourism in Greece

As discussed in the previous chapter, tourism has become an important sector of the global service economy, driven by social, cultural, and economic changes. Greece relies heavily on it, as it contributes an 18 to 20% of the country’s GDP (mfa.gr, 2024). Recent promotion of cycling tourism with the aim of supporting sustainable development requires the involvement of the local communities, local volunteers often maintain the infrastructure and make cycling tourism a part of public life as in the case of Valdresbanen Rail-Trail in Norway (Bakogiannis, Vlastos, Athanasopoulos, Christodoulopoulou, Karolemeas, Kyriakidis, Noutsou, Papagerasimou-Klironomou, Siti, Stroumpou. 2020). In Greece, cycling tourism is part of a broader approach to eco-tourism and is seen as a way of boosting local economies and protecting natural resources. Despite the limited national infrastructure for cycling, projects such as the CYRONMED (CYclo Route Network for the MEDiterranean) initiative and the planned Attica Rail-Trail are showing potential. To develop a coherent strategy, cooperation between the public and private sectors is essential, as demonstrated by Scotland’s National

Cycle Tourism Forum, including analysing success factors, developing long-term strategies and action plans for investment (Bakogiannis 2020).

Greece faces more challenges in developing cycling tourism, due to country's limited cycling infrastructure and cycling's limited popularity, reduced road safety and lack a cycling culture. Cycling tourists are further discouraged by the prohibition of bicycles on many forms of public transport as well as by the inadequate infrastructure. Despite these problems, with the right policies in place, Greece could become an attractive destination for cycling tourism, due to its mild climate, unique terrain, diverse natural environment, cultural and historical attractions and adequate road networks (Tsitoura, Tsartas, Sarantakou, Kontis, 2021).

As well as technical infrastructure and a safe cycling environment, touring cyclists have other needs, such as accommodation, food, retail shops and bicycle repair and maintenance shops. These needs should be covered locally, on the cycling path. Such cycling-friendly culture and services are as crucial as the scenery itself (if not more).

On the basis of the results of the interviews and the literature review which Bakogiannis et al. (2020) studied, a number of indices have been developed for the evaluation of economic activities and services of interest to cycling tourists. These indexes are organised into six categories: retail trade, catering services, accommodation, rental activities, bicycle repair services, and land transportation. Common criteria include providing information, seasonality, small-scale bicycle repairs, linking to local identity, internet access, bicycle access and supervision, and service guarantees.

Three EuroVelo routes cross Greece: The Mediterranean Route EV8, the ROUTE EV 11 and the "Iron Curtain" trail, Culture Route of Europe EV13." The Greek National EuroVelo Coordination Centre (NECC), established in 2021 as Greece became the 23rd country to join the EuroVelo network, is responsible for the control, improvement, and promotion of the three EuroVelo routes in Greece (EuroVelo). All EuroVelo routes crossing Greece are, presently only on paper, but hopefully the above developments mean a strong start for the recognition of the importance of cycling infrastructure and sustainable transport in the country.

3.1.2 Cycling tourists in Greece

Tsitoura et al. (2021) used structured surveys in Greek and English to understand the demographic, economic and social characteristics of domestic and international cycling tourists, as well as their level of satisfaction with Greek tourism companies and the factors that influence their decision to engage in cycling tourism. The sample of domestic cyclists was collected via Facebook and Messenger, resulting in 296 responses, while the sample of foreign cyclists was collected from participants in cycling blogs (https://www.cyclingforums.com/forums/the-bike-cafe.25/ and https://www.cyclechat.net/), resulting in 24 responses. The surveys explored preferences, motivations and the impact of cycling infrastructure, transport and accommodation when deciding to cycle. Surveys show that most cyclists, both domestic (77.7%) and foreigner (88.3) are men aged 45-65. For both, the most popular cycling destinations are the Peloponnese and central Greece with low-traffic routes and scenic landscapes. Foreign cyclists spend €26-50/day for accommodation when domestic cyclists spend less. Both groups emphasise the importance of bicycle storage and 'bike friendly' accommodation, while foreign cyclists show greater interest in guided tours. For foreign cyclists, clear signposting and reliable information are very important.

All the studies above confirm that cycling tourism is a growing niche market that offers economic, social and environmental benefits. It is particularly in line with the principles of sustainability and enhances the well-being of rural areas. In Greece, thanks to the mild climate, the variety of landscapes and some networks of provincial routes, cycling tourism can be an extension of the tourist season in combination with other thematic forms of tourism. Key factors for the development of cycling tourism are safe and comfortable routes, natural landscapes, accessible public transport, appropriate facilities, such as bicycle storage, effective marketing and co-operation between stakeholders. The maintenance, marking and signalling of the three EuroVelo routes passing through Greece could be a first step. However, one of the main obstacles to the development of cycling tourism is the lack of coordination on a national level, as well as the lack of interest for investment into the infrastructure. Road safety is a big issue, as well as the lack of a cycling culture, which constitutes a big part of the safety issue. Although Greece has a well-developed public transport network via buses, cycling tourism is not included in the operational and marketing strategies of transport. Restrictive policies on many modes of transport and the lack of appropriate infrastructure (e.g. special bicycle racks on buses, parking spaces on trains and ferries) discourage cyclists. In these conditions cycling tourists choose

other countries which already offer very good options for cycling tourism. The main tour operators sell some cycling products, but not as the main product; instead, they are offered as add-ons to the main holiday.

A national strategy with clear objectives within a sustainable framework, as well as coordination and cooperation at regional, local and business levels, is essential for the successful development of cycling tourism in Greece. Greece's first national cycling strategy is under development. To provide access to cycling tourism opportunities, a network linking all stakeholders, including small businesses, is needed. Marketing, monitoring and key actions should be overseen by a single body comprising the public and other stakeholders. Thematic cycling routes should be created by local providers and promoted through strong marketing plans as part of a national tourism brand. In addition, an organisation should monitor the economic, environmental and social impacts of cycling tourism, while actions such as the integration of cycling information online, the improvement of bicycle transport regulations and the funding of cycling events should be implemented, to further support development. The National Bicycle Strategy should aim to: Increase the use of bicycles as a means of transportation for the general public by 2030; increase trips by bicycle, in combination with other means of transport; integrate bicycle sharing systems in the transportation system of Greek cities; promote the use of bicycles for the transportation of light goods over short distances; boost cycling tourism; promote the bicycle as a suitable economic means for daily transportation; increase cycling for sports and leisure; increase bicycle use to tackle climate change; provide incentives, support and know-how to increase bicycle use in the public and private sectors. (GTP 2020)

3.1.3 Bicycle friendly initiatives in Greece

NATTOUR is a non-profit organisation for the promotion of environmental protection and alternative, including cycling tourism. It has developed the 'bike friendly' certification for hotels and destinations that fulfil criteria, in partnership with the Hellenic Society for the Protection of Nature (EEPF). Certified hotels are required to provide services such as secure bicycle storage, repair kits and maps of cycling routes. The "Bike Friendly Destinations" network is made up of selected municipalities that excel in environmental protection, sustainable tourism, encouraging all to use bicycles and promoting a 'cycling identity'. According to Tsitoura et al. (2021) the number of certified partners obtaining the Bike Friendly

label grew rapidly after its launch, counting 135 hotels, 9 municipalities and more than 60 parts in 2024.

Another way of promoting cycling tourism could be via races, events, guided tours and bicycle rentals, which make bicycles more visible in different ways. One example is the The Historica organised in Rhodes since 2017. The event highlights the island's culture and history, through its scenic routes. 4-5 days event, Historica creates a festive atmosphere with exhibitions of antique bicycles, traditional music and local food, educational activities for students.

There are also local and foreign companies in Greece that offer bicycle tours as well as hotels that offer bicycle rental options to their customers. Currently, there are many guided tourist bicycle tours on offer (mostly with e-bicycles) in Athens and some in other Greek cities.

In 2022 the European Cyclists' Federation (ECF) hosted a delegation led by Greece's deputy minister for transport, to discuss the improvement of cycling conditions in Greece. The delegates agreed to work together to improve road safety and promote cycling, with Greece having recently signed the European Cycling Declaration. The aim of this initiative is the development of a strategic policy on cycling at EU level and the promotion of more EU funding for cycling infrastructure and promotion. (ECF. 2022).

In January 2024, the first meeting of the National EuroVelo Coordination Centre in Greece was held. It was decided that the participants would co-ordinate their efforts for the development of EuroVelo at regional and local level. The ministry declared its commitment to the monitoring and development of these routes, ensuring proper signage for cyclists' safety and promoting cycling tourism by highlighting routes through natural and cultural attractions. It believes that by reducing traffic congestion and emissions, EuroVelo will help to promote a cycling culture and improve sustainable urban mobility. To achieve these goals and ensure a sustainable future for transport, the Ministry is working closely with other relevant ministries.

In April 2024, the first cycling tourism conference named "The present and future of cycling tourism in Greece" was held in Athens, as a part of the 10th Athens Bike Festival.

During the 2000s, there were many protests by cyclists and cycling organisations in Athens, demanding safe roads and improvements for cycling infrastructure. The protests stopped during the economic crisis of 2010-2017. During the 2020 pandemic, the absence of cars in the streets

encouraged people to use their bicycles. However, after the pandemic restrictions were lifted, the use of private cars and motorcycles rose to unprecedented levels, as people were trying to avoid crowded buses for health reasons. Due to safety concerns and the lack of a cycling culture, commuting by bicycle failed to achieve permanence. In 2023, the Critical Mass rides appeared in Athens again.

3.2 Sustainability and territorial development in Greece

The 364-paged, second Voluntary National Review (VNR) of Greece (2018-2021) highlights the progress made in policy, legislation, financial instruments, partnerships and reforms to achieve the SDGs. The VNR was prepared by an SDG working group involving all ministries, the Hellenic Parliament, local authorities, social partners and civil society members. VNR assesses and reports on the country's progress implementing its 2030 Agenda, aligned with the UN SDGs.

The Greek 2030 Agenda focuses on economic, social and environmental sustainability. It guides the recovery from COVID-19 and promotes green and digital transitions, employment, social cohesion and private investment. Greece has a strong focus on stakeholder participation with the involvement of local and regional authorities, social partners, civil society members and research institutions. Sustainability is promoted through civil society networks. With a focus on sustainability and territorial development, the Hellenic Parliament is essential in advancing the 2030 Agenda through legislation and international cooperation. With an emphasis on environmental and economic sustainability, Greece's National Energy and Climate Plan and the 2022 Climate Change Law aim to achieve climate neutrality by 2050. Sustainable rural and economic development is also supported by the National Rural Development Programme (RDP) and the National Research and Innovation Strategy for Smart Specialisation.

One of the key challenges addressed in the report is to reduce dependence on private cars and road infrastructure. Greece is addressing urban challenges by promoting sustainable mobility through alternative modes of transport such as walking, cycling and public transport. These efforts are part of broader strategies to increase the resilience of cities to climate-related disasters and to improve the quality of life in the face of environmental and social pressures. It is important to promote sustainable urban mobility at the local and regional levels to meet the needs of citizens in terms of quality of life and safety. In this context, the Government decided, in 2021, to introduce a comprehensive legal framework for the uniform preparation, review,

monitoring and control of Sustainable Urban Mobility Plans (SUMPs). Under this legislative initiative, all regional authorities and municipalities with a population of more than 30,000 are required to prepare SUMPs.

Complex interactions between different political and economic actors pose sustainability challenges for spatial planning in Greece. The planning process is often non-transparent and uncoordinated, resulting in lost opportunities for democratic cooperation that would reduce conflicts and delays in infrastructure projects. Privatisation efforts have undermined environmental sustainability and public accountability, leading to inefficient outsourcing and speculative development. The Hellenic Republic's Asset Development Fund (HRADF) facilitated low-quality, unsustainable projects through legislative changes, while public planners largely failed to resist and sometimes engaged in corruption. Privatisation aimed to replace centralised bureaucratic planning with more democratic processes. However, this has often not been achieved. Decentralisation efforts in the 1990s, which were intended to involve citizens in spatial planning, have not been effective, as local professionals continue to focus on traditional urban planning. The prevailing bureaucratic culture has led to recurrent regional and local crises by emphasising narrow expertise that is inadequate to deal with complex spatial issues. In order to improve sustainability, Greece must revive democratic practices through the involvement of citizens in collaborative spatial planning initiatives and the balancing of public and private interests.

3.3 Tourism and tourism infrastructure in Greece

International tourism in Greece began in the 1950s as the country began to recover from wartime devastation (WWII and civil war). Initially, the focus was on sightseeing in Athens and Thessaloniki, but islands such as Mykonos, Corfu and Rhodes soon attracted visitors. From 1965 to 1985, there has been a growth in tourism as Greece began to establish itself as a summer holiday destination, with an influx of tourists from Europe and the USA, whose numbers rose, from 1.6 million in 1970, to 8.9 million in 1990. This rapid growth led to environmental degradation and a shift from the cultural to 'sun-and-sea' type of tourism. Tourism infrastructure also rose; today Greece has 40 airports, out of which 15 are international, and about 10,000 hotels. Despite their proliferation, these hotels are characterised by poor spatial planning and a lack of concern for the environment. Data supports the view that the distribution of hotels is strongly linked to particular destinations, especially coastal areas, where the vast

majority of Greek hotels is situated. Regardless of the region in which they are located, most hotels have been built in close proximity to the sea (Menegaki, Agiomirgianakis, Arvanitaki, 2019).

Greece has traditionally followed a model of mass tourism based on the '4S' approach (sea, sun, sand and sex), which was popular in southern Europe in the 1970s and led to significant tourism and economic growth. However, this model is giving way to the '4E' approach, which focuses "on Environment and clean nature, educational tourism, culture and history, Event and mega event, Entertainment and fun". This approach is giving rise to some alternative models such as slow tourism, which emphasises time, slowness, authenticity, sustainability and emotional engagement. An example of this slow tourism model is the Costa Navarino hotel company, in the Peloponnese, which supports local products and activities. Tourism in the Peloponnese is mainly concentrated on the coastline, with fewer inland destinations, that attract mainly domestic tourists. There is potential for a shift to the 4E model, especially in regions of natural beauty and historical value with a desire to preserve their cultural identity. The inland regions have fewer overnight stays, but offer the potential for further development, supported by sporting facilities and packaged tourism (Papamichail 2019). Spetses mini marathon and Taygetos challenge are two more examples of supporting local communities through specific events.

Spetses mini marathon

Initiated by the Poseidon Hotel in Spetses, in 2011, the Spetses Mini Marathon is a multi-event (1,5K and 3K swimming, 5K, 10K and 25K running, as well as children's races) sports weekend, in the off-season, in October. The event has been embraced by the people of Spetses and supported by the Municipality of Spetses and numerous volunteers. It has become deeply integrated into the life of the island. The commitment of the organising committee, the sponsors, the volunteers and the athletes has been the key to the development and the continued success of the event.

Taygetos challenge

The Taygetos Challenge, a mountain running event in Kardamyli, Peloponnese, dates from 2010 and has had a significant impact on regional development, extending the tourist season and boosting local businesses. The event, which takes place on March 28th during the low season, now sees hotels, restaurants and taverns open specifically for the influx of participants

and visitors. This expansion is helping to combat the seasonality of the region, which is traditionally limited to the summer months, by promoting Kardamyli as a year-round destination.

3.4 Railways in Greece

The development of Greece's railway infrastructure can be divided into periods which are parallel to the country's macroeconomic and socio-political changes. From the 1830s to the 1920s, Greece's infrastructure development lagged behind other European countries. This was due to socio-economic instability and delayed industrialisation. The first railway line, between Athens and Piraeus, was built in 1869. However, significant expansion efforts began in 1882 under Charilaos Trikoupis (Prime minister of Greece who also campaigned for the Corinth Canal and many construction campaigns which lead to the country's first of many bankruptcies.); these lead to the establishment of the Piraeus-Athens-Peloponnese Railways (SPAP). During the Second World War, the Greek railway network was severely damaged, followed by a period of reconstruction supported by the Marshall Plan. In the 1960s, SPAP operated an integrated transport system of trains, buses, and ferries, promoting railway tourism. However, the military coup and subsequent regime of 1963-1973 caused infrastructure development to stop; following the restitution of democracy, the period from 1974 to 1980 was marked by limited development due to political and economic instability. From 1987 to 2007, Greece undertook large infrastructure projects with EU funding, including the modernisation of the railway system. Despite the increase in funding and policy changes, Greece's planning culture remains influenced by political cronyism, which has an impact on decision-making (Papamichail 2019). Many railway lines which were closed during the economic crisis in Greece are still closed, after more than a decade.

3.4.1 The year 2023: The Tempi railway accident and the floods in Central Greece

On February 28^{th,} 2023, 57 people, mostly young students, died in a tragic collision between a passenger train and a freight train in Tempi, central Greece. This incident exposed the serious safety shortcomings of the Greek railways, which were already considered to be the least safe in Europe. The official investigation found that the stationmaster made critical mistakes while safety systems designed to prevent such human error failed. Among the causes of the disaster were the absence of the European Train Control System (ETCS) and the frequent theft of copper cables. The latter disrupts the signalling system needed for ETCS to work. In addition, the

Greek railway system has been suffering from severe budget cuts and understaffing since 2010, a fact which resulted in poorly maintained infrastructure and inexperienced staff in key positions. “It is telling that OSE went from employing around 6.000 people in 2010 to less than 1.000 people in 2021.” (Dimitrakopoulos 2023) The Greek railway system has been subject to political patronage, with the result that inexperienced people have been appointed to key positions on the basis of their political connections. In the aftermath of the disaster, the government increased OSE's funding and accelerated safety upgrades. The ETCS installation was scheduled to be completed by November 2023. However, catastrophic floods caused by Storm Daniel in September 2023 wiped out much of the recent progress, underlining the challenges posed by years of austerity. “As a result, the work now has to start from scratch. “It will probably take us many months to return the railway to the point it was 15 days ago [before the floods],” admitted the newly appointed Infrastructure and Transport Minister, Christos Staikouras, in a recent interview. “The work [on the railway] will have been completed by 2026,” he concluded, attempting to reassure the citizens. However, a lot of them will probably be sceptical of the minister’s reassurances”. Because of the incidents above, the railway line connecting Athens, the capital of Greece to Thessaloniki, the second biggest city of the country, was disused for months. Buses were used to connect the parts of the line that were still operational. The line is now almost fully operational, but the increase in journey times from 4.5 hours to 6-7 hours and concerns about passenger safety have led to a further reduction in demand for trains.

3.4.2 The railway network today

Hellenic Train S.A., formerly TrainOSE S.A., is a private Greek railway company that operates passenger and freight services on the lines of OSE. Initially a subsidiary of OSE, it became an independent state-owned company in 2008 and was privatised in 2017, when it was acquired by Italy's national railway company, Ferrovie dello Stato Italiane. The Italian railway group bought the company for €45 million and was the sole bidder in the privatisation, which was managed by the HARDF. It was renamed Hellenic Train in 2022. During the rebranding ceremony, The Greek government announced plans to invest €4.5 billion to make the country greener by modernising the railways, with the acquisition of hybrid and modern trains and the digitisation of passenger services. The CEO of Hellenic Train, Maurizio Capotorto, highlighted the plans for new railway lines, hydrogen-powered trains and the improvement of suburban rail

services. He also highlighted the company's role in the connection of key ports, such as Piraeus, Thessaloniki and Alexandroupoli, in order to boost freight transport. (Kathimerini 2022)

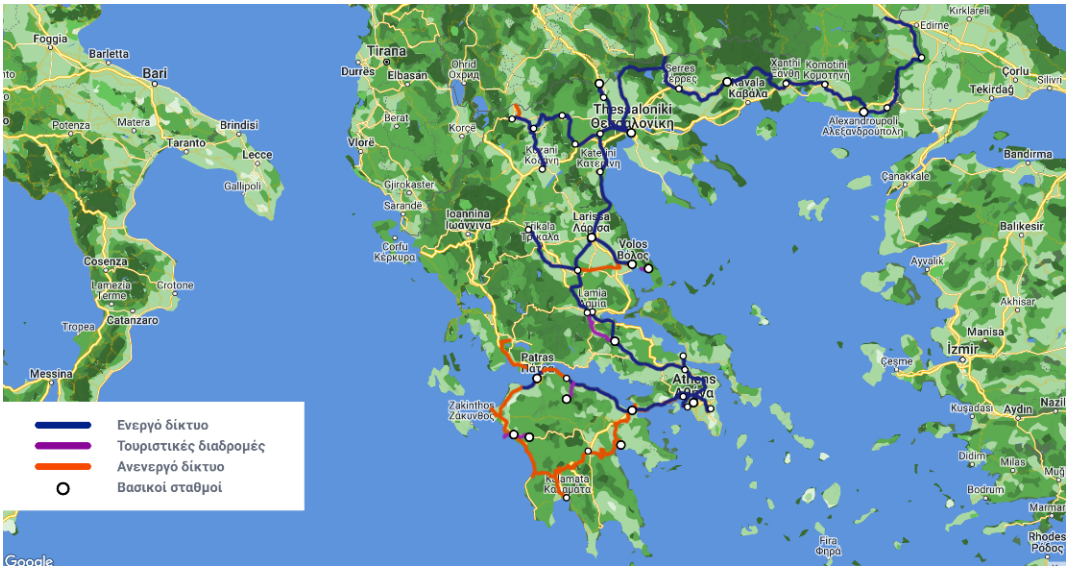


Figure 9 : The current network status of railways in Greece (OSE, 2024)

Blue: Lines in use / Purple: Tourist lines / Red: inoperative lines / o Main stations

The Athens-Thessaloniki route accounted for about 60% of the annual turnover of the Italian company in the Greek market. The fact that the population density is concentrated in two cities (Athens and Thessaloniki) confirms this data, but the same data also shows how other lines are not used and left idle. The current network status of railways in Greece is shown in figure 9. Athens still has no railway connection with the country's third biggest city, Patras, which is also the port of departure for most of the ferries connecting the country to Italy.

3.5 The core case study: Peloponnese

The Peloponnese region was chosen as the subject of this study for a number of reasons, which have been mentioned in previous sections and will be explained in detail in the following ones. Although there is a network which covers almost the whole region, a big percentage of the railway network in the Peloponnese is not in use. The north part of the network, which would connect the capital city, Athens to another important city, Patras, is only half operational. Patras is one of the ports (the other one is Igoumenitsa) that connect the country to Italy for passenger and freight transport, as well as to the iconic Interrail route for many young Europeans.

The reasons for choosing the Peloponnese region as a case study can be summarised as follows:

- There is a diverse railway network, including standard gauge, metric gauge and rack-and-pinion systems. This network of railway lines covers almost the entire region and can be revitalised and integrated with the cycling paths.
- The variety of landscapes available to travellers, ranging from seaside beaches to wooded and gorges. It has rich historical and cultural heritage sites, located at short distances from each other. All these locations are within close proximity.
- The potential for different types of tourism (e.g. agrotourism, wine tourism, gastronomy, nature, cultural/historical, cycling) and the variety of route difficulty, from leisure ones to those better suited to experienced cyclists offer many possibilities.
- Most of the region is not overly urbanised. This would help preserve natural areas which are still in good condition.
- It would provide a stable source of income for rural areas and less developed regions while helping to prevent the depopulation of small villages
- It is an ideal setting for a pilot project, with its manageable size and distinct regions and its easy access to two major cities: Athens and Patras.
- Key infrastructure elements are already in place, such as the Athens-Patras railway line and the airports in Athens, Kalamata and Araxos; which improve accessibility and support the growth of tourism.

Patras, Kalamata, Korinthos, Sparta, Tripoli and Aegion are the most densely populated areas in the region. In stark contrast, most of the rest of the Peloponnese are depopulated. As motorways connect the towns and cities, they tend to concentrate the population there, leading to depopulation and destruction of the rural areas. Whereas the multitude of railway stations used to function as a string of financial and social hubs, their gradual abandonment has contributed the region’s decline.

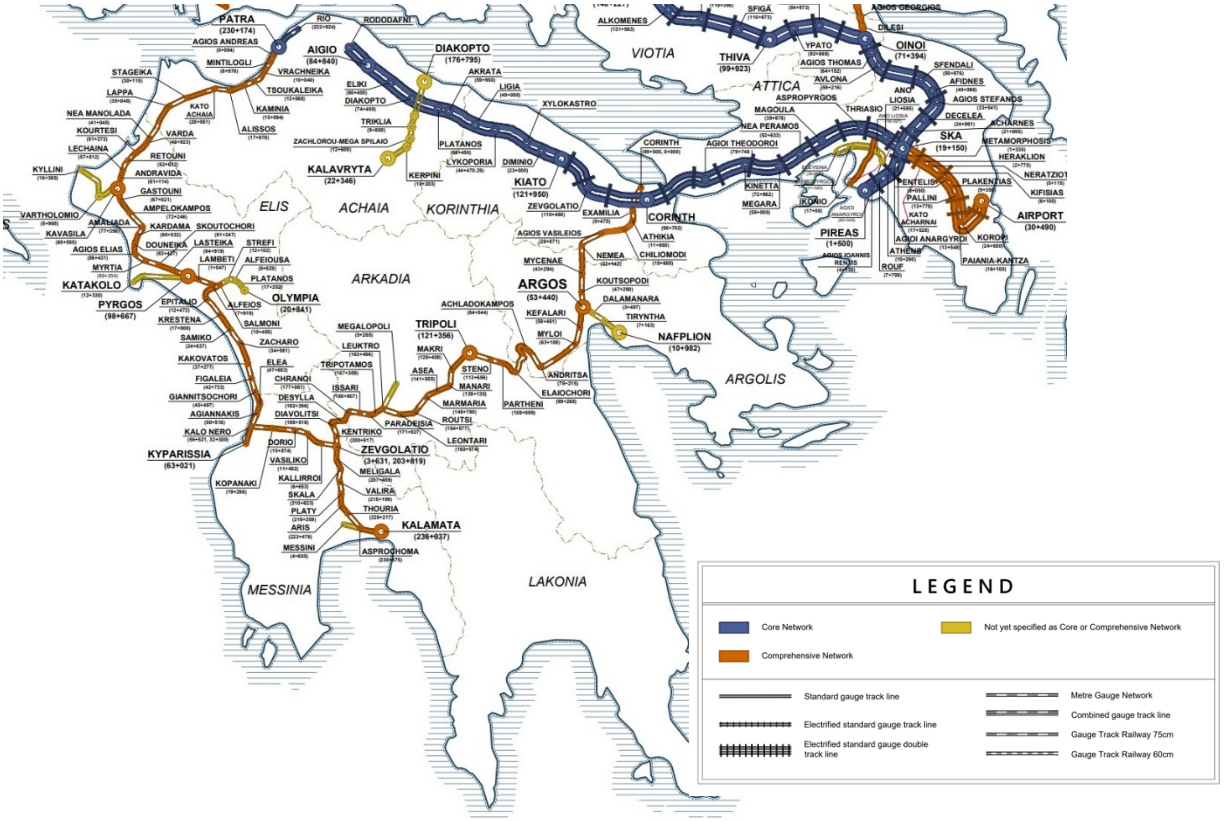


Figure 10: Railway network in Peloponnese with railway stations (OSE, 2024)

3.5.1 Official approach to integrating railways and tourism

The strategic approach to railway and tourism development in Greece emphasises the importance of railways for socio-economic growth, sustainability and cohesion with EU transport policies, as outlined in the General Framework for Spatial Planning and Sustainable Development (GFSPSD). The North Peloponnese Railway Axis is of national importance, because the Athens-Patras railway connection is crucial as part of the Orient-East Mediterranean Corridor (TEN-T) and the Patras-Athens-Thessaloniki-Evzoni (PATHE) corridor, including the planned improvements and upgrades to enhance the Port of Patras. Integrated transport systems, for both freight and passengers, are mentioned as a part of the transport infrastructure.

Article 6 critically emphasises the need to develop integrated transport systems linking railways with other infrastructure, including ports and airports. Priority will be given to urban and long-distance rail transport. The focus will be on network development, safety, speed improvements and integration with other modes of transport. Extension of suburban rail services to

metropolitan areas and dynamic urban centres, and possible promotion of rail and tram services in major urban areas is another key point of the article.

Article 7 outlines a sustainable tourism development strategy which, among others, aims to promote development in accordance with geographical and cultural characteristics. The plan contains sections on spreading tourism activity to less exploited areas; opening up new regions to tourism, for balanced regional development; protection of the local resources; decentralizing the Athens metropolitan region for a balanced regional development; promoting an interregional cooperation.

This national approach is defined on paper as it is summarized above, but Papamichail (2010) identifies several problems related to railway infrastructure and tourism in Greece. First, the General and Regional Planning Frameworks offer broad directives but lack specific project details, which leads to flexibility but also inconsistencies and deviations among different planning levels. For instance, recommendations for railway connections are often vague, lacking clarity about the specifics of upgrades. Additionally, there are strategic classifications and development priorities, but these often remain abstract, without detailed studies, timelines, or cost assessments. This lack of precision affects the feasibility and implementation of transport projects, creating a disconnection between the theoretical plans and their practical implementation. Conflicts of interest further complicate the situation. Various stakeholders, including bus and railway operators, often have conflicting interests, and the absence of processes to manage these adversarial interests makes it difficult to implement combined transport solutions. This is particularly evident in the conflict between bus and railway operations at the Port of Katakolo. Moreover, there is a significant gap between planning frameworks and their actual implementation, particularly in terms of timeframes and costs. Theoretical references to rail tourism and alternative tourism types in planning frameworks often do not translate into practical action. For example, the upgraded metric railway section between Corinth and Kalamata was abandoned despite theoretical support. The complexity of legal procedures and the need for public consensus also led to delays and conflicts, especially in major infrastructure projects requiring land expropriations. Hidden interests and political pressures further complicate the situation, making it difficult to achieve the necessary public consensus for such projects. In addition to these issues, there is a lack of feedback and monitoring mechanisms to address challenges and conflicts during implementation. This gap

between planning frameworks and their implementation means that upcoming problems and conflicts are not adequately addressed. Overall, the Framework needs more precise, coordinated, and adaptive planning processes to address the complexities and conflicts inherent in developing railway infrastructure and promoting tourism in Greece.

3.5.2 Integrating railway infrastructure and cycling tourism in the Peloponnese

According to the Official website of the Greek National Tourism Organisation (visitgreece.gr) the Peloponnese contains 5 UNESCO World Heritage Sites. Besides these and other significant archaeological sites, the area also contains thermal springs, natural parks, mountains and caves, as well as forests, gorges and ravines (ideal for activities like rafting or climbing). It also has wine producing area. There are also destinations such as vibrant cities (Nafplio, Kalamata, Corinth), historic towns (Nafplio, Monemvasia), picturesque mountain villages (Dimitsana, Kalavryta, Vytina et al.), beaches and coastlines (Elafonisos, Epidaurus et al.). All these are an indication of the potential of the Peloponnese as a tourist destination for different types of travellers who are in search of different activities. This potential will be further explored in this study, with a view to integrating cycling tourism with the existing railway infrastructure, which luckily cover almost the entire region, and will hopefully be used in the future. Before moving on to this topic, let us take a look (in the next section) at the combined train and cycling routes that were possible in Greece in the past. The purpose of this is to show that an infrastructure for cycling tourism was (and still is) in place in the region, from the time before the railways were underused or abandoned. With such a history, natural environment and infrastructure, cycling tourism is ready to be established as a tourism product for Greece; all that is needed is the revitalisation of the railways.

3.5.2.1 Previous multi-modal routes in Greece

Φίλοι του Ποδηλάτου/ Friends of bicycle' cycling club in Athens has created several itineraries for those wishing to combine train travel and cycling. Linear routes (example route 1 and 3) that start at a train station and end at the same station or at a station closer to it could offer a lot of variables in the planning of the routes. Circular routes may provide other route choices where they have a large rail network, as in the Peloponnese, or as in example route 2. Ferries could be added in some regions to provide flexibility and more options when planning routes in a country like Greece, which is also a maritime country. Figure 11, 12 and 13 shows the examples of multi-modal routes in Greece: yellow: train route, dark blue: bicycle route.

Figure 11: Route 1 – 1998, excursion of 25 pax; (source author)

Figure 12: Route 2 – 1995, excursion of 15 pax (source author)

Figure 13: Route 3 – 1998, excursion for 20 pax (source author)

3.5.2.2 Potential regional cycling tourism routes, integrated with railways in the Peloponnese

Cycling and walking are two sustainable modes of transport and two ways of travelling at the same time. They are slow, compared to other modes of transport, and require a certain amount of physical effort; combining them with other modes of transport could make them more attractive. The end result would be a win-win situation for all stakeholders: the environment will be protected, active transportation will be promoted, local economies will be supported, rural areas will become accessible, and more. It is for the reasons outlined in the previous sections that the region of the Peloponnese has been chosen for this study. An assessment of these interrelated factors, following the mapping of the natural terrain, cultural and historic sites, population distribution and tourist hotspots, could identify potential areas for the development of railways integrated with cycling routes.

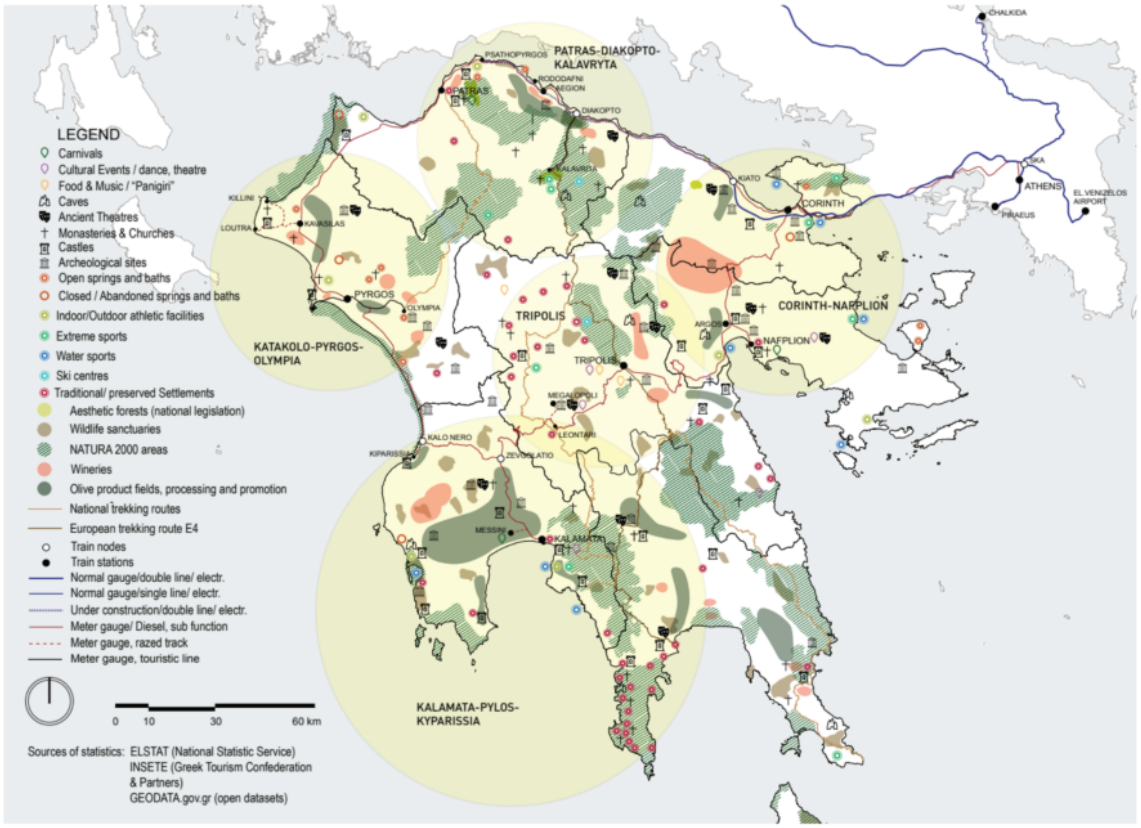


Figure 14: Potential enclaves for tourism-oriented railway development in the Peloponnese (Papamichail 2019)

Figure 14 shows potential areas in the region that could be developed for tourism with the integration of the railway network. This study intends to be a step forward, by adding cycling routes in four potential enclaves, already identified in the previous work. This, will enable tourists to explore areas between the railway lines, instead of being restricted the areas close to the stations. This exploration would be of great benefit to the economic and social development of the region, as already mentioned, through the creation of new jobs, the preservation of existing nature and historical monuments as well as the preservation of cultural identity and more.

At present, cars or buses are the main means of transport in the Peloponnese. There are three isolated sections of the railway that are still in use: Athens-Patras (standard gauge), Katakolo-Pyrgos-Olympia (metric gauge) and Diakopto-Kalavryta rack railway (single-line, 750mm gauge). The railway line between Athens and Patras is not fully operational. A passenger departing from Athens can travel by train as far as Aigio; then the passenger will have to change to a bus provided by the railway company to get to Patras. The line, which runs from Athens to

Kiato and is part of the Proastiakos (commuter) railway network, is electrified and has frequent services. Kiato is connected to Aigio by an extension of the Proastiakos line. Although the line is not electrified, diesel multiple units (DMUs) are used on this section of line. On the Patras side, there are two sections, Patras-Rio (to the east, towards Athens) and Patras-Kato Achaia (to the west). The Patras-Rio line is still under construction; it is projected to become part of the extension of the Proastiakos suburban railway network, to improve local connections. The Patras-Kato Achaia line reopened in 2019 and is currently operational, serving commuters with DMUs, as part of the Proastiakos network.

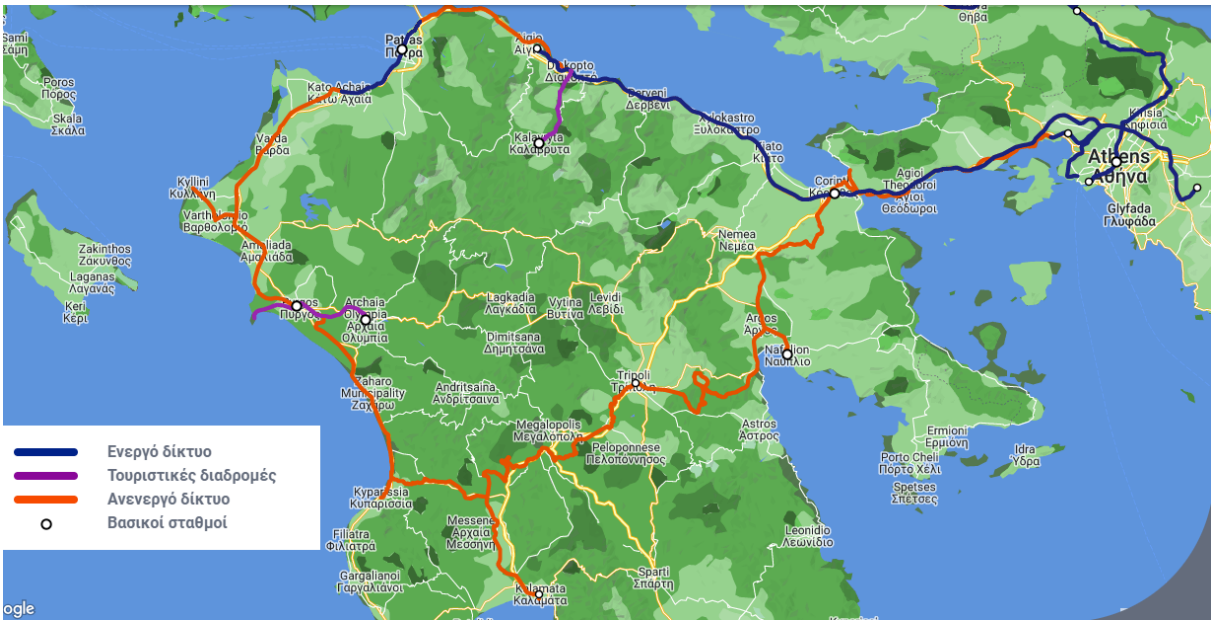


Figure 15: The current network status of railways in Peloponnese (OSE, 2024) – Detail of Figure 9

Blue: Lines in use / Purple: Tourist lines / Red: inoperative lines / o Main stations

The Katakolo-Pyrgos-Olympia line and the Diakopto-Kalavryta rack railway are exclusively tourist lines.

The following sections will point out some of the routes (distances can be found in annex II) that can be covered from a railway station to the tourist attractions close to it by bicycles and e-bikes. The aim is to show that the combination of train and bicycle, without the need for other modes of transport, could offer a variety of options to different travellers. The bicycles could belong to the tourists or be available for hire at the train station. At the moment, the only way to visit these places is either by car or by bus, powered by fossil fuels.

Corinth-Nafplion region

Besides Corinth and Nafplion, two important cities, the region boasts a multitude of historical and cultural sites situated along the railway line or in its vicinity. All these could easily become available to cycling tourists by the activation of the railway line and adjacent cycling routes. In most places along the line, the rails and slippers are in good repair, with few signs of wear; they could be reused for the rehabilitation of the line with minimal maintenance. However, because the line has been disused for a long time, the plants that have grown among the rails and slippers will require almost rebuilding the line from scratch (re-ballasting, posing of slippers and rails). The line is in metric gauge. Bringing in rolling stock over the severed metric line would pose a severe challenge, with the only viable (but expensive) option being most probably by sea, to the harbour of Nafplion. The situation of abandoned stations and the rails can be seen at the photos 1-5.

Photo 1 Nemea-Dervenakia railway station (source author June 2024)

Photo 2 Nemea-Dervenakia railway station (source author June 2024)

Photo 3 Old railway station in Nafplion (source author June 2024)

Photo 4 Abandoned almost unused railway lines near Nemea (source author June 2024)

Photo 5 Abandoned almost unused railway lines near Nemea (source author June 2024)

Katakolo-Pyrgos-Olympia region

The main attraction in this area is the archaeological site of Olympia, where the Olympic Games were first held. The region, including the areas of Killini and Zacharo/Kaiafas (the latter a protected reserve) is known for its wellness and nature tourism. The Port of Katakolo a popular cruise ship destination; the large number of arrivals is a strain for the protected areas of the region. The Katakolo-Ancient Olympia railway line is operational; if rail services were better synchronised with cruise ship schedules, the use of cars and coaches could be reduced, improving sustainability.

Kalamata-Messini-Pylos region

With a new motorway and increased air traffic, the Kalamata-Messini-Pylos region, including the southern area towards medieval Mani, has seen rapid tourist development. Kalamata attracts cultural and nature tourism, agritourism, educational and conference tourism and is becoming a popular weekend destination. Pylos, on the west coast is boosted by the Costa Navarino hotel company. The hotel offers exclusive tourist services including cycling tours and attracts a specific tyoe of tourists. This has led to a strong collaboration between local producers, who offer a wide range of facilities. Extending the rail line could enhance the regions' attractiveness. The cultural and historical importance of this region would apply justify the extension of the railway line from Kyparissia to Pylos. Bus and e-bike connections to the medieval settlements of Mani could also be included. Rail connection to Patras could be developed.

Tripolis region

Situated on a plateau, the city of Tripoli and its surrounding traditional settlements offer considerable potential for tourism development based on a 'slow' model to preserve the identity of the area. The region is home to nature reserves, cultural monuments from different historical periods and international trekking routes. The railway between Miloi Nafpliou and Zevgolatio, known for its unique landscape and arc bridges, could easily be nominated as a UNESCO Cultural Heritage site. This would promote sustainable tourism, while ensuring the preservation of settlements and landscapes; it would also enhance the area's attractiveness as an international tourist destination, resulting in economic and social benefits for the region.

In conclusion, the use of railways for tourism in the Peloponnese could create new rail links that, although not a priority of the EU or the Ministry of Transport, could open up new tourism markets and contribute to the economic regeneration of local communities, especially in mountainous areas. Through actions and offers such as combined rail-and-bus tickets, or discounts on museum, hotel and cultural attractions. For instance, visitors arriving to specific destinations or attractions by train could be offered a discount on entrance tickets or other tourism-related services. Tailor-made tourism packages for different age groups, such as teenagers, young people (possibly with an Interrail pass), families and pensioners, could range from one-day to week-long trips. This would encourage cooperation between stakeholders and maximise the benefits of such investments.

4. Findings

Having reviewed available sources, interviews have been conducted to specific stakeholders in order to grasp how the integration of rail and cycling tourism for sustainable regional development in Greece is supported and perceived. Results have been summarised into three main categories: opportunities, a path to sustainable territorial development and challenges.

4.1 Opportunities

> *"It [the railway] should not be forgotten. It should not be seen as a thing of the past. But it should also be considered as something that bears potential for the future." (Stefan Estermann, Swiss Ambassador to Greece, 23.07.2024)*

4.1.1 Using existing and potential assets of the region

Revitalising the Peloponnese railways

News of a discussion between Greece and Switzerland appeared in Greek newspapers in June 2024. The focus of the talks was the modernisation of the infrastructure and the enhancement of the Peloponnese railway line's (currently Europe's longest meter-gauge railway network) as tools for attracting tourism and promoting regional development. Switzerland's involvement is considered crucial, because of its advanced railway technology (especially on metre-gauge lines) and expertise. The aim of this co-operation is to restore of the historical significance of the railway, while at the same time improving its economic viability and regional connectivity. The historic mountain railways in Switzerland could serve as a very good model, highlighting the potential benefits for both tourism and passenger transport, initiating discussions and involving the relevant stakeholders.

> *"The role of the Swiss Embassy is to provide a platform for the different Greek actors to engage with the idea of revitalising the narrow-gauge line in the Peloponnese. The question is how to raise awareness about the existence of this railway network (which seems to be forgotten) among political actors and show all actors involved, some in the economic sphere, some in level of governments, that this old ancient railway system has potential for the future." (Stefan Estermann, Swiss Ambassador to Greece, 23.07.2024)*

Bicycle-sharing systems at the train stations

By offering a multi-modal travel experience that combines the efficiency of rail transport with the flexibility of cycling, bicycle sharing is a key element in the integration of rail and cycling tourism. This integration allows tourists to conveniently explore destinations beyond train routes, without the need for a personal bicycle, as they can easily switch from train to bike.

Through the provision of bike-sharing facilities at train stations, travellers can seamlessly continue their journey on two wheels, increasing the accessibility of remote or scenic areas. This multi-modal approach not only promotes sustainable travel (reducing the need for car rentals or extensive infrastructure, such as large parking lots) but also enriches the overall tourist experience by combining the speed of the train with the freedom and intimacy of the bicycle.

> *"In some train stations, if there are shared bicycles, I can unlock it and have a tour in the surrounding area of this train station, then leave it, and then take the train to go to the next city." (Stefanos Tsigdinos, reseacrher, 10.05.2024)*

Preserving cultural heritage

The Embassy of Switzerland is in cooperation with ELLINIKI ETAIRIA (Society for the Environment and Cultural Heritage - ELLET), a non-governmental organisation dedicated to the preservation of Greece's natural environment and cultural heritage. With more than 170 railway station buildings, various viaducts and tunnels, the railway network of the Peloponnese represents a huge cultural heritage.

> *"The idea is that you can only preserve it by making it work again. So this is a very important point." (Stefan Estermann, Swiss Ambassador to Greece, 23.07.2024)*

4.1.2 New tourism products

The need for alternative tourism products

> *"The tourism ministry is trying to expand the products. This is something that has been on the agenda for many years. They have started saying that we want alternative tourists, and then they expand it with. We want more types of tourist products that can extend the seasonality of Greece and the places that people visit. Because the places are specific to the sea locations but we do have mountains, we do have a lot of mainland destinations that are not explored yet. I can say that the exchange of the scenery between one place and the other in Greece is amazing. There is so many things you can do. This is not explored as yet. But of course, yes, we need to go towards this direction, because the main tourism flows are in very specific areas of Greece. Other areas have a very low percentage of the pie of tourists. Yes, the answer is definitely yes, but it's also the political agenda as well. The whole thing is how to do it." (Maria Theofanopoulou, travel industry expert, 03.07.2024)*

> *"70% of them say I go for the sun and the sea, 15% come for the antiquities and 3% for the food and all the others are 0 something. Currently, there are markets [for cycling], like Mallorca, Germany and the Netherlands. People prefer to go there, because everything is safe. There are services for cyclists. Because they have made the product, that's the difference." (Georgios Drakopoulos, tourism industry expert, 22.04.2024)*

Greece, with its reputation for great weather and beautiful coastlines, faces a cultural problem as regional governors and mayors who focus heavily on promoting their beaches. Not all coastlines can compete with the famous beaches of islands such as Mykonos or Crete, even though the entire country is surrounded by beaches, with the longest distance from a beach being a mere 132 kilometres. Rather than promoting lesser-known and/or inferior beaches, regions like Central Greece would benefit more by promoting unique products like (such as cycling, hiking, rafting etc) which would help them stand out and appeal to different markets. This approach highlights the need to develop, promote and provide services to support these alternative forms of tourism. However, Greece has historically been slow to invest in such initiatives, and despite EU funding and demand, cycling infrastructure remains underdeveloped. To remain competitive and sustainable, the government must prioritise and support diversified tourism options.

> *"me as Greek... I didn't know about this route, and a very good friend of mine, who is from Great Britain told me." (Spiros Papageorgiou, EuroVelo coordinator of Greece, 30.04.2024)*

Cycling as a tourism product

Like rail tourism, cycling tourism is about more than just travelling; it is not just about getting from A to B, but about creating a complete experience. It may be the main component, but it may also involve other attractions such as gastronomy, wine-tasting, local handicrafts and sporting events. The Peloponnese, with its scenic beauty, offers a great deal of potential for combined rail-cycling tourism. However, in order to market it effectively as a unique tourist experience, it is essential to create attractive packages that combine these elements.

> *"So yes, I do believe there is a big potential for cycling in the Peloponnese." (Stefan Estermann, Swiss Ambassador to Greece, 23.07.2024)*

> *"Greece as a major product; sun, sea and beach, but obviously there are plenty other forms of tourism which can complement the basic offer and cycling is among one of them." (Georgios Drakopoulos, tourism industry expert, 22.04.2024)*

There are many different types of cycling activity, from the casual evening ride, to the more challenging mountain bike ride. The opportunity lies in the diversity of the cycling market, which caters for both the leisurely and the more adventurous tastes. Overall, most of those interviewed said that cycling and walking tourism should be prioritised because of its economic and environmental benefits.

> *"Last April [2023], 23% of our guests had at least one cycling day." (Vaggelis Petroulakis, cycling tour guide in Greece, 09.05.2024)*

Extension of tourist areas and the tourist season

The development of rail and cycling infrastructure can transform less well-known areas into attractive tourist destinations, which is a driver for economic growth and regional development.

> *"We go to less visited places and we have the power of bringing a group in off-peak season." (Jemima James, cycling tour operator in Greece, 06.08.2024)*

Cycling through remote areas

> *"The region, the landscapes. Everything is perfect. It reminds us of the Alpine scenery. But it's better because there are no cars, no traffic up in the mountains, there are very, very few cars because we have designed our routes to go through some remote villages." (Lefteris Fates, cycling tour operator in Greece, 07.08.2024)*

> *"I think cycling can play a very, very vital role in regional development. Through cycling in different regions, different cities, the smaller ones will have the opportunity to have visitors and visitors who will stop often who would like to take some bread or water, or fruit, or whatever, from the local shops. This will give life to other parts of Greece." (Spiros Papageorgiou, EuroVelo coordinator of Greece, 30.04.2024)*

There is considerable potential for stimulating the local economy through the integration of railway infrastructure with cycling tourism in the Peloponnese. Especially in remote areas, the revitalisation of the existing railway network can create new jobs, support small businesses and stimulate economic growth. Economic activity can be sustained by providing affordable transport options that extend the tourist season and expand tourist areas. However, to fully realise these benefits and ensure long-term sustainable growth, challenges such as rural depopulation and economic volatility need to be addressed.

Using secondary roads

> *"When you use your bike, you choose a different network, a network of secondary roads, which don't usually pass from the main street or the main tourist attractions. Cycling can help reduce the environmental impact of tourism by promoting sustainable travel options." (Spiros Papageorgiou, EuroVelo coordinator of Greece, 30.04.2024)*

A successful regional project example - Costa Navarino

The Costa Navarino resort is an example of how a significant private investment can lead to wider regional growth, encouraging the government to support and attract businesses, residents and tourists. It has had a stimulating effect on the local economy through the creation of jobs and the attraction of investment. The resort also offers outdoor activity options: cycling (road, mountain and trekking), hiking, and rock climbing which take place outside the resort but in the nearby region.

> *"We have routes like starting from 10 kilometres to go to a beach and come and come back, like a half day. We have road bicycles. There are guided tours. We prefer nice scenery and to avoid main roads." (Michael Widmer, Costa Navarino cycling tour guide in Peloponnese, 27.07.2024)*

Cycling tourism expertise need

> *"We need to have more people coming and coming, and also find a good tour operator specialized in cycling." (Vaggelis Petroulakis, cycling tour guide in Greece, 09.05.2024)*

Like any other tourism products, cycling tourism needs professionals. In order to attract more cycling tourists, targeted marketing and a well-developed infrastructure (such as cycling friendly routes and support services) are needed. Specialised tour operators are crucial, as they provide expertise, tailor experiences to demand and ensure the safety and satisfaction of cyclists. In addition, crucial in developing a thriving and environmentally-friendly cycling tourism sector is the development of local expertise and the implementation of sustainable practices. By taking these needs into account, destinations will be able to effectively cater for cycling enthusiasts and build a successful cycling tourism industry.

4.1.3 Protecting physical and mental health

> *"After the Corona years, more Greeks got to know about the e-bike tours." (Lefteris Fates, cycling tour operator in Greece, 07.08.2024)*

Open minded stakeholders

> *"Yes, especially from the municipality of Rethymo. They are interested in what we are doing. And now, they asked me for my help to promote more. All this thing about the cycling in Rethymo, and generally in Crete." (Vaggelis Petroulakis, cycling tour guide in Greece, 09.05.2024)*

There are many mayors who ignore cycling in their city, but there are also many who support it. Mayor Dimitris Papastergiou of Trikala and Mayor Giorgos Marinakis of Rethymo have each worked to develop cycling infrastructure in their cities. Papastergiou has focused on the integration of extensive cycle lanes into Trikala's transport network, while Marinakis has been working on the expansion of cycling routes and their integration into Rethymno's tourism strategy. Their efforts are a reflection of a common commitment to the promotion of cycling as a sustainable and beneficial mode of transport in their communities.

Cycling advocacy

The history of bicycle advocacy in Greece dates back to the 1990's and 2000's, when activists successfully campaigned for significant changes. During this period, public support grew and policies began to change to favour cycling. Since then, however, progress has stagnated. There have been few major advances in recent years. The cycling community's early successes illustrate the potential impact of dedicated advocacy; however, maintaining momentum and achieving long-term infrastructure changes remain challenges in promoting sustainable urban development.

> *"No, nothing really big has happened concerning cycling. I mean, if you're out cycling, you're at your own risk." (Georgios Lialios, environmental journalist. 13.03.2024)*

> *"I'm thinking of establishing a cycling association, not [for] sport cycling, but for people living here in Kalamata to make excursions with [their] children, [and] to give education at schools. I started two years ago in schools, voluntarily, and it would be nice to put it in a more stable base, let's say to bring cycling culture into Greek culture. Actually, it's not so easy. Yes, but of course we would need also. We would need to press the government to install some cycling routes." (Michael Widmer, cycling tour guide in Peloponnese, 27.07.2024)*

4.2 A path to sustainable territorial development

> *"I believe very much in the potential of cycling tourism here, especially also sport cycling. So, people come for training. Except the main roads, except the season, many areas are empty in rural regions. Municipalities don't think of cycling as a product, and they don't see this." (Michael Widmer, cycling tour guide in Peloponnese, 27.07.2024)*

With more and more European tourists looking for active holidays, cycling tourism has potential. However, there has been a lack of investment in the sector by many Greek tourism professionals. There are small, local initiatives, such as in the Peloponnese, but they often lack the expertise or resources to meet the specific needs of cyclists, such as high-quality bicycles.

> *"Last year we had the Tour of Hellas. It was very well organised, and the street got closed down. But there were no people. There were no people supporting the cyclists. So, from this you can see that there is no local interest. In France or in Italy, if there is a race going through a village, of course the whole village is on the street, and support the cyclists." (Michael Widmer, cycling tour guide in Peloponnese, 27.07.2024)*

4.2.1 Affordable transportation for all

If the Peloponnese Railway network is revitalised and put into use again, initially with a view for tourism, it will also incidentally benefit local residents, as they will also use the improved rail infrastructure, leading to lower transport costs, with consequent improvement in quality of life and mobility.

> *"When the citizens start to be more persistent in what they are asking, and they start to demand more from the politicians. Then the system will have to work in a better way."(Spiros Papageorgiou, EuroVelo coordinator of Greece, 30.04.2024)*

However, it is important to first clear some fundamental questions:

> *"Is travelling by train possible and likely to happen? Can the desired destination be reached by rail? Among the alternatives, is the train a viable mode of transport? Does it meet the needs in an efficient way, both in economic terms and in terms of passenger comfort? Within these parameters, rail should be considered as a viable option." (Pınar Pinzuti, cycling tourism expert, 12.04.2024)*

> *"Before the lack of infrastructure, there is a lack of education, in my opinion. The whole nation of Greeks sees the bicycle as entertainment, not a way of transport." (Lefteris Fates, cycling tour operator in Greece, 07.08.2024)*

4.2.2 The role of national and local politicians in creating new tourism products

> *"It is important to have an understanding of who does the development planning and who is involved in the process. Including the relevant components at the top of local government in the committee would be very useful in terms of inclusiveness. Feedback is essential for effective planning, particularly in terms of good governance. The plans that are developed at different levels have an important role to play in shaping the process. The regional plan and its priorities should be part of the annual work programme. Typically, a development agency follows a regional plan to address provincial issues and streamline service processes, and aligns it with its work program. This programme interacts with other key policy documents along with the regional plan." (Doğan Çelik, sustainable development expert, 16.07.2024)*

> *"Politicians have a crucial role to play in developing new tourism products. They can provide strategic direction for the country's tourism and facilitate the efforts of professionals. The government should bring together small, passionate groups engaged in activities such as trekking, cycling and climbing, and help them to expand their activities in a professional manner. This means recognising these activities as a legitimate sector of tourism, streamlining bureaucratic processes, and providing access to funding and support similar to that which is available to hotels and travel agencies. It also requires local governments to understand and support the benefits that tourism events can bring to their communities. For example, allowing road closures for cycling events can attract visitors and promote local areas. By creating clear professional categories, simplifying tax and regulatory frameworks and encouraging collaboration through associations, governments can help small businesses grow and improve the tourism industry as a whole. There are a lot of constraints and a lot of problems making these small businesses become larger. One of these problems has been that the professional activity of this business is not recognized as a tourism activity. So, if you want to start an activity as a cycling tour for example, just very few years ago, you didn't know what kind of activity was that. I mean, you have to be a travel agent, you have to know which KAD (the specific type of profession that a company receives when they start a business.) type of company it should be. Government should be there to facilitate all this process, try to understand all these professions that they have started, and they ought to give them the right profession to open a new path, KAD and put them in a specific frame of taxation and also include them in funding tools. So, there is funding for hotels, which is a well-known profession. There is funding for travel agencies, but all the rest they need to find a way how they can have access to funding." (Maria Theofanopoulou, travel industry expert, 03.07.2024)*

> *"Sometimes the local governments they do not know, cannot understand the benefit that events can bring to the local community. They might not facilitate the process of allowing the road to be closed for three, four hours for this race to take place." (Maria Theofanopoulou, travel industry expert, 03.07.2024)*

A knowledge gap among local government representatives and tourism officials is another major challenge in promoting cycling tourism. These stakeholders struggle to communicate effectively with the travel industry and miss opportunities to attract this specific and potentially lucrative market segment due to a lack of expertise in niche tourism areas such as cycling. This

makes developing the necessary infrastructure and services difficult, ultimately limiting the region's ability to capitalise on the economic benefits of cycling tourism. It highlights a need for specialized training to fill these gaps and ensure tourism professionals can effectively market and promote niche tourism activities.

> *"And we are planning to join some tourism exhibitions to get to know some people with our expenses. The municipality is not keen to offer flight tickets to some experts. They cannot speak to travel agencies about cycling, because they have no idea how it works." (Lefteris Fates, cycling tour operator in Greece, 07.08.2024)*

4.2.3 Supporting local economies

> *"Cycling tourism connects with the local economy by offering numerous small-scale business opportunities, rather than centralizing all activities in one major hub. Tourists can support local cafes, restaurants, and accommodations, thus distributing economic benefits more evenly."(Angela van de Kloof, advisor on sustainable transport, 22.04.2024)*

> *"Cyclists spend more money than regular tourists. They eat and drink in remote areas where tourists are not going. They come outside the beach season. And they are interested in the landscape and history." (Michael Widmer, cycling tour guide in Peloponnese, 27.07.2024)*

There are three important ways in which cycling tourism can stimulate local economies and support local businesses. According to our respondents, first, cyclists visit areas off the main roads and motorways, meaning that they rely on local businesses for food, accommodation and other services along their routes; as a result, local businesses, such as hotels, restaurants and bicycle-rental services, experience an increase in tourism-related income. This influx of cyclists eventually leads to the establishment of businesses that cater specifically to the needs of cyclists, in addition to other tourists. Second, it encourages the creation of jobs in the tourism industry and related sectors. The arrival of more tourists and the opening of new shops to cater for them creates new employment opportunities especially in rural and lesser-known regions. Third, the potential exists of developing new businesses that cater to cycling tourists, such as cycling guided tours or equipment and repair shops.

> *"We run quite high-end tours. The quality of the accommodation is important, but we want small intimate places. We don't want a big hotel that's owned by someone in Athens. We'd rather have something locally owned and family orientated. We want to stay in a cool family-run guest house. That's ideal, completely beautiful, locally run, like the owners getting involved in things." (Jemima James, cycling tour operator in Greece, 06.08.2024)*

> *"The same with restaurants and things like that. We don't want a big chain with lots of restaurants. We don't want fancy food, but we want good food. Everything we do, we try to source as locally as possible. We are trying to eat at places where the food is sourced locally." (Jemima James, cycling tour operator in Greece, 06.08.2024)*

> *"The train stopped at Levadia station, and souvlakia (porkmeat on a spit) vendors were waiting for the train's passengers, as were the passengers themselves for this treat. We hung from the open windows and bought food from these local producers, without even leaving the train. After this main course, it was time for dessert at the station of Lianokladi. Again, [came] the local vendors, this time with traditional rizogalo (rice pudding) or yoghurt." (Alexios Menexiadis, member of cycling club in Athens, 04.04.2024)*

Many villages in the Peloponnese are getting depopulated. The local population misses the old railway stations, which once served as social centres and are now abandoned. Revitalising the railway network and reopening these stations could rejuvenate these communities by attracting people, investment and activities, such as small hotels and cultural events. This revitalisation could bring life back to these small communities and make them vibrant and important once again. Railway stations could be a catalyst for the revitalisation of traditional areas in the Peloponnese and the reversal of their current decline.

> *"What are you giving back to the local community? In every single village we're just eating with someone from that village. They don't have a restaurant. They just cook. So we're going to eat with them, and the accommodation is like in one place. We've built our own tented camp. We rent the land off of them. We use one of their guys as a security guard when we're not there. Collaboration with the local village, it's giving back into the community a bit." (Jemima James, cycling tour operator in Greece, 06.08.2024)*

4.2.4 Effective rail transport strategies

For the development of rail tourism, it is vital to have regular train services with connections to the main network. A regular service prevents problems such as landslides, obstructions in the lines and broken trains, as it ensures daily maintenance. Without a regular service, the cost of maintenance can be exorbitant and fall disproportionately on the tourist operator, making it unsustainable. For example, the high cost of clearing and preparing the neglected metre-gauge railway in the Peloponnese highlights the financial burden of sporadic maintenance. It is therefore essential to maintain a consistent daily service in order to manage costs and to ensure a reliable and enjoyable tourist experience.

> *"Get regular train traffic first (if connected to the mainline network). Else: get regular train service" (Nick Fotis, railway journalist, 29.03.2024)*

> *"Stop building any new lines; use the existing networks better and more efficiently." (Nick Fotis, railway journalist, 29.03.2024)*

> *"Frequency is the key, not higher speeds. Having a TGV-class train running every three hours on the Athens-Thessaloniki corridor (which hosts nearly 7 million people) is a huge waste of infrastructure investment. Running intercity trains every hour over this route, with a maximum speed of 160 km/h, would be much more effective in attracting passengers. (I remember reading a Swedish paper which mentioned that the critical frequency was at 8+ train pairs per day for passenger tickets demand rising fast)." (Nick Fotis, railway journalist, 29.03.2024)*

Smart pricing can also play a significant role:

> *"Initiatives, like the €9 ticket in Germany, exemplify how practical, cost-effective solutions can promote the use of public transport and cycling." (Angela van de Kloof, advisor on sustainable transport, 22.04.2024)*

4.3 Challenges

4.3.1 Implementation of national mobility and tourism strategies

There have been delays and criticism of the Greek government's attempts to develop a National Cycling Strategy. Although the Ministry of the Environment has announced the Strategy, it has proceeded at a slow pace, and little tangible progress has come to light. Public procurement processes have been criticised for their lack of transparency and efficiency, often handled by bodies such as the HRADF. These problems illustrate systematic challenges in Greece's public administration, where bureaucracy and lack of clear responsibilities may impede timely and effective implementation of sustainability projects.

The use of funding on railway infrastructure

Despite the availability of EU funding, Greece has not significantly modernised its railway network. This is largely due to a lack of understanding of the value of railways. Between 1995 to 2021, Greece invested more than three times more in roads than in railways. Despite the fact that, trains are more environmentally-friendly mode of transport than cars, and that the authorities often take advantage of this fact; the state of the existing infrastructure is in poor condition, reflecting the general undervaluation of rail transport in the country. Greece spent €41.1 billion on motorways and €12.6 billion on railways (Rudolph, Riach and Kees 2023); Greece's motorway network has grown by 410%, while the rail network has shrunk by 5% in that period. Four major passenger rail lines (389 km in length) and 97 railway stations, have

been closed down temporarily or permanently. This means that thousands of people have been left without rail services.

National strategies vs. local implementation

Greece is working on a national strategy for cycling, but such strategies often fall short in terms of practical application. Due to poor implementation and lack of local commitment, these strategies are more symbolic than practical. It is at the local level, driven by mayors with a vision to promote cycling, that real changes in cycling infrastructure and policy are made. Local political will, rather than national policies, is more likely to develop effective cycling infrastructure. The real challenges faced by cyclists, such as safety concerns and lack of infrastructure, are often not addressed by national policies.

> *"Hostile environment. And the strategy does not answer these."*
>
> *"The municipal level which will foster cycling, not the national level of strategies." (Konstantinos Athanasopoulos, researcher at NTUA, 29.07.2024)*
>
> *"I think you have to go with specific projects to a specific mayor. Let's say municipality and it has to be small enough so that it can be done in 4 years as long as they are in power. Yes, because otherwise it will never end. And the government, the municipality they want to afterwards they want to show. Look, I did this. I think it has to be small steps." (Michael Widmer, cycling tour guide in Peloponnese, 27.07.2024)*
>
> *"The local mayors and the local governors want fast results because they have been elected for 4 years. But we need 10 years to have good results, to make a difference, and nobody can wait for 10 years. They want it in 3 months, if possible. Promise it for 3 months. But if you tell them otherwise, you are out of the discussion." (Georgios Drakopoulos, tourism industry expert, 22.04.2024)*

The importance of open-minded stakeholders

It is very important to identify the stakeholders and enable them to connect, in order to launch and sustain a product, project or event. Which players are involved is determined by the type of activity. The people who visit the region may need a hotel, a restaurant, a shop, a vehicle or a guide, the same way they need infrastructures like airports or railways to arrive there. The local communities of the specific areas need to understand the value that this product, project or event will bring to their area.

> *"The politicians want to do things concerning cycling, but most of the time they don't know how to do it. So, we are trying to facilitate this for them." (Spiros Papageorgiou, EuroVelo coordinator of Greece, 30.04.2024)*

"Most of those people are civil servants... obliged to work with tons of other projects." (Maria Siti, mobility expert, 26.04.2024)

"The people who are working in the municipalities, they never cycled, or they just cycled with us once per year, something like that. So, we were trying to explain to them why cycling is important." (Spiros Papageorgiou, EuroVelo coordinator of Greece, 30.04.2024)

"One thing that can somehow deter them from taking their car or from making long distance routes. It's the economic parameter. We have to find the balance between the mindset and the infrastructure." (Stefanos Tsigdinos, researcher, 10.05.2024)

Continuity

"The politicians have different plans and needs when they are being elected. They want to present that they are doing something new and something new means that they don't want to continue what the previous politician did. The continuity is not good in Greece in terms of politics." (Spiros Papageorgiou, EuroVelo coordinator of Greece, 30.04.2024)

Planning vs. actual acting

"They just announce them. They just integrate them in some texts, but they do not actively take actions." (Stefanos Tsigdinos, researcher, 10.05.2024)

In Greece there is a fragmented approach where comprehensive plans are only partially implemented, leaving critical elements such as restricting car access and reducing parking spaces unaddressed. A highlight also is the tension between planning and implementation, particularly in a political environment where local leaders might prioritise immediate public approval over long-term sustainability objectives.

"Include the bicycle and sustainable mobility. As you may understand, it is a different thing to have someone prepare a plan for you and to implement it, implementation is always harder, especially in a country like Greece, where it is very often that you see the mayors implementing the parts of their SVAK plans that are easier, that would be more acceptable by the general public. So, you end up with a mosaic of measures instead of the full thing." (Georgios Lialios, environmental journalist. 13.03.2024)

"When you go and have a discussion and talk with the authorities about all these, they do nothing, because they are afraid of losing votes. Who can build these bike lanes? Because it won't be me." (Lefteris Fates, cycling tour operator in Greece, 07.08.2024)

One such example of a flawed project is the 'Wine Routes of Northern Greece' initiative, aimed to link a number of wineries together to form a unified route for tourists. The government supported the plan with the creation of a detailed presentation and the collection of information

about the wineries. However, without the involvement of travel agencies to market and sell the wine route experience, the project stalled. Without getting the whole tourism chain involved, including the sellers, the project could not get beyond planning and still remains almost inactive.

4.3.2 Car lobby issues

> *"Nobody cares about cycling. Why? Because, there is no money behind cycling. And there's huge money behind cars and petrol and constructions for cars."*
>
> *"But the train cannot go to Patras. The same construction companies constructed the roads to Patras." (Stefanos Katsolis, surveyor and transport specialist ,13.05.2024)*

In many countries (Annex I), including Greece, the influence of the car lobby poses a major challenge to sustainable transport. Policies and investments that prioritise road expansion and car ownership over more sustainable alternatives such as public transport or cycling infrastructure often result from the strong pressure of car interests. Undermining efforts to promote environmental sustainability, this focus on car-centric development exacerbates traffic congestion, air pollution and carbon emissions. In addition, it diverts resources away from the improvement of regional connectivity and the development of transport options that could better integrate rural and urban areas. As a result, regions outside urban centres face inadequate connectivity, which stifles economic growth and exacerbates regional disparities. In order to address these issues, a shift in policy focus is needed, with an emphasis on sustainable transport solutions and equitable regional development to ensure a more balanced and environmentally friendly approach to transport.

> *"There is the example of Astypalea. There is this Smart Island program where they teamed up with Volkswagen to turn the island to become electric. And Volkswagen is financing changing all the vehicles in the island from regular to electric. This is a very interesting experiment. The only problem is that Astypalea at the moment does not have any renewables.so this means that the power chargers are powered by petrol. This is the reality. This is the surrealism that may sound a little bit familiar about what's going on." (Georgios Lialios, environmental journalist. 13.03.2024)*

Currently, in Greece vast amount of money are being invested in improving road infrastructure. The role of the railways is very small and almost unknown. The initiative of the Swiss Embassy aims to sensitise the Greek public and the Greek authorities with regards to the railways; to

make them see that the roads are not the only part of transportation that is important, and realise the value of railways, which have great potential for the future.

> *"I don't think that there are so many tourists that want to travel from Corinth to Kalamata by train, because with the bus, you're in Kalamata in one and a half hours, and with the train you will have 5 hours. Yeah, but the scenery is better from the train." (Michael Widmer, cycling tour guide in Peloponnese, 27.07.2024)*

4.3.3 NIMBY issues

Involving local communities in planning and implementing regional projects can lead to significant complications. A notable example is the lengthy extension of the standard-gauge railway to the city of Patras. It was delayed for over two decades, due to local government demands for extensive underground construction.

> *"They shouldn't. Seriously, every time local communities get involved, the situation deteriorates badly, with NIMBYs (not in my backyard) attacking every project, requiring the tracks to go underground for many kilometres in order to not spoil their view, etc., making the costs skyrocket and huge delays." (Nick Fotis, railway journalist, 29.03.2024)*

4.3.4 Problems in the railway network

> *"For almost two decades, almost all the metric-gauge network has been inoperative (with the exception of two small segments around Pátras and the Katákolo-Olympia line), after a derailment in the rebuilt eastern segments near the center of Peloponnese. There's an ongoing effort to install an automatic train protection system (ETCS Level 1) on the standard-gauge routes, delayed almost by two decades. The lack of such a system contributed to the deadly Tempi head-on collision on February 28th, 2023, while in September 2023, heavy floods destroyed almost 180km of tracks in the region of Thessaly, just as the ETCS installation was being completed. So, the first priority is to repair things to a more normal state. The passenger monopoly is offering a very inadequate passenger train service, with fewer train services than before privatisation and selling it to FS. The rail freight market has three operators active, but the bad state of the network isn't helping (and lack of maintenance in the Macedonia-Thrace region has doomed passenger trains, with many slow orders in place that raised the time in the Thessaloniki-Alexandroupoli segment to 8.5+ hours instead of the normal 3.5 hours in 2004)" (Nick Fotis, railway journalist, 29.03.2024)*

The effect of Tempi accident

Over the years, improvements on the Athens-Thessaloniki line reduced the duration of the journey, attracting an increasing number of passengers, until the accident. Now the journey takes longer (a result compounded by the effect of the floods) and many people hesitate to choose the train, fearing that it is not safe. This public perception of the trains as unsafe severely undermines their potential as a mode of transport.

Thefts

A few of the interviewees mentioned frequent thefts in the railway network, wherever the lines are not in use. Even two entire locomotives and rolling stock were stolen in the Peloponnese! Dressed as public workers, the thieves cut up the locomotives and loaded the parts to trucks, without anyone challenging their authority.

> *"I think that in many cases I have heard stories about the tracks being stolen, as scrap metal. It's been unused for so long, that people just go and steal the rail tracks to sell them as scrap." (Georgios Lialios, environmental journalist. 13.03.2024)*

This would change if the network was well maintained and in actual use.

4.3.5 Connection with other countries

The fact that Greece, as a result of the Yugoslavian civil wars of the 1990's, is not well connected to its neighbouring Balkan countries and thence to Europe, could be one of the reasons why Greece is so far behind regarding the railways. Germany, France, Italy and Switzerland are all within easy reach of each other. Like the Alpine Pearls case study, cross-border collaborations could generate different markets. These markets, in turn, could create different opportunities and needs which could benefit the transport infrastructure. As Greek trains are mainly intended for the interior of Greece, the modernisation of the railway systems has been given low priority, as other things were deemed more urgent and important. Although the country has procured the necessary safety systems, these were never installed, which was one of the reasons of the Tempi accident.

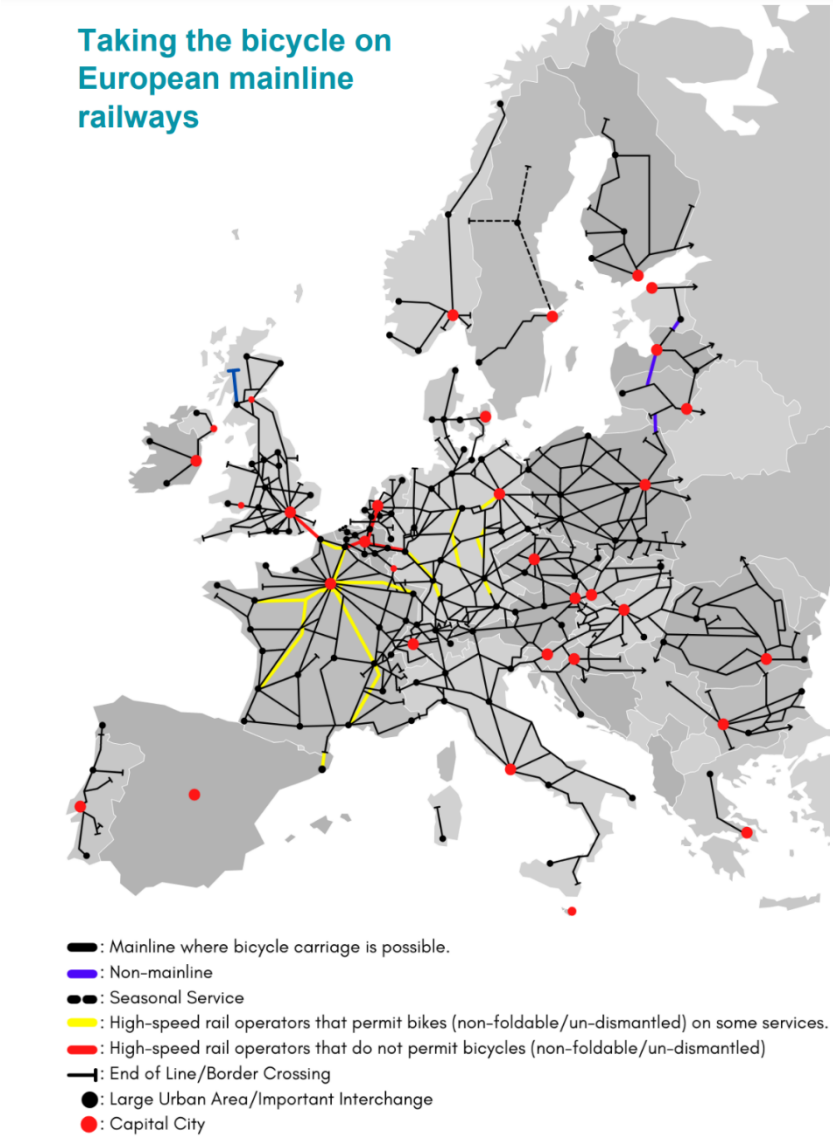


Figure 16: Taking the bicycle on European mainline railways (ECF 2021)

4.3.6 Cycling infrastructure

> *"We want to make a cycling route in Peloponnese. We not only have to analyse the road network, but we should also analyse what we should connect. For example, we should not only connect the archaeological sites, but we can also connect a forest. We can also connect, like a very unique landscape. In Nemea, in Corinth there are some vineyards. So, you can make some wine cycling routes which are thematic routes for cycling, and they are very, very interesting for cyclists and the cycling tourists because we have to differentiate between tourists and everyday cyclists. They're different." (Stefanos Tsigdinos, researcher, 10.05.2024)*

There is a lack of extensive cycling infrastructure and initiatives in Greece. Although there is some interest and a few small companies rent out bicycles, there is a lack of large-scale, coordinated efforts. The EuroVelo network in Greece exists only on paper. The challenge is to

ensure continuity and investment in cycling infrastructure, despite changing governments and priorities. In spite of these challenges, through local efforts and alignment with European networks, such as EuroVelo, there's hope that Greece will develop a more robust cycling tourism industry. However, for this to happen, sustained commitment and investment from both the public and private sectors will be required.

Companies that organise cycling tours in Greece avoid main roads for safety reasons and plan their routes through remote areas and side roads where they can avoid traffic.

> *"The roads are quiet, so we haven't had massive problems with drivers or anything like that. We deliberately pick very quiet roads. If we can." (Jemima James, cycling tour operator in Greece, 06.08.2024)*

4.3.7 Multi-modality

> *"Speaking in Greece about multi-modality and railroad tourism is a joke. Bus operators are very flexible, offer all the required comforts, can go everywhere and are available at a telephone call. Try to arrange a special train trip with the current monopoly, I can guarantee you weeks and months of frustration." (Nick Fotis, railway journalist, 29.03.2024)*

Bicycles on trains

> *"The EU has implemented new regulations that require all new and refurbished trains to include designated spaces for bicycles. This legislation, which came into effect in June 2021, mandates that all new trains must provide a minimum of four spaces for bicycles. This move aims to promote more sustainable and integrated transportation options, encouraging people to combine cycling with train travel. As for implementation, the adoption varies across different countries and train operators. Some regions and companies are already well ahead in providing bicycle spaces, while others are gradually adjusting to meet the new requirements. This legislation is part of a broader EU strategy to increase the use of bicycles and public transport as a means to reduce carbon emissions and traffic congestion. In line with the efforts made by our members to improve multimodality and the use of bicycles on trains, the UIC signed an agreement with the ECF in 2021. This topic is addressed in several of our groups related to tourism, commuter and regional trains, stations, customer experience, and sustainability, where good practices and guidelines are exchanged to enhance the experience of all customers and promote sustainable mobility." (Vanessa Perez, advisor at UIC, 17.07.2024)*

Today, the Athens-Thessaloniki railway allows a mere 3 bicycles on each train. At the time of ticket purchase, the railway company must be informed of the bicycle and a bicycle ticket must also be purchased. These three bicycles allowed, are transported in a separate carriage where they are loaded by the railway company's staff. Twenty years ago, the number of bicycles in Greece could have been as high as 25. Cycling trips (routes and number of bicycles transported)

by train in Greece have already been mentioned above. In many European countries, the bicycle and the passenger are transported in the same carriage. Some carriages even offer the possibility of charging one's bicycle during the journey.

4.4 SWOT analysis for the integration of railway infrastructure with cycling tourism in the Peloponnese

Table 6 shows the SWOT analysis for integrating railway infrastructure with cycling tourism in the Peloponnese, which assesses the potential benefits of promoting environmentally friendly tourism through and regional development, while taking into account challenges.

Table 6 SWOT analysis of the Peloponnese

Case study	Aspects	Strengths	Weaknesses	Opportunities	Threats
Case study: Peloponnese	Economic	**Revitalising the existing Peloponnese railways**: Potential to boost tourism and local economy. **Supporting local economies**: Enhanced local business and community growth. **Affordable transportation**: Cost-effective travel options. **Extension of tourist areas and the tourist season**: Expanding tourism opportunities for economic benefits.	**Depopulation in rural areas**: Challenges in sustaining economic activities.	**Cycling through remote areas**: Potential to attract niche tourism markets and promote eco-tourism. **New product development options through cycling tourism**	
	Social	**Accessibility**: Improved access to transport and tourism opportunities. **Flourishing local communities**: Enhanced community development and cohesion.	**The effect of Tempi accident**: Negative impact on public perception and safety concerns.	**Some regional project examples**: Demonstrate potential for successful social and community projects. **Cycling advocacy** **Preserving cultural heritage**: Promoting and maintaining local culture and history.	**The effect of Tempi accident**: Ongoing safety concerns affecting social acceptance.
	Environmental	**Against climate change and for the conservation of resources**: Promoting sustainable travel options. **Using secondary roads**: Reducing environmental impact by utilizing existing infrastructure.		**Against climate change and for the conservation of resources**: Positioning as an eco-friendly destination. **Growing interest in sustainable transport and tourism.**	**Overtourism**: Environmental degradation and negative impacts on local communities.
	Technical/Infrastructural	**Railways in Greece – infrastructure**: Existing rail infrastructure to build upon. **Metric gauge**: Specialized knowledge and experience.	**Problems at the railway network**: Issues with the current state of neglected infrastructure. **Cycling infrastructure**: Inadequate facilities and safety measures.	**National Cycling Strategy and its implementation**: Boosting infrastructure development. **Multi-modality**: Enhancing travel efficiency and convenience.	**Problems at the railway network:** Potential delays in upgarding the infrastructure and cost overruns.
	Political/Planning	**The importance of open-minded stakeholders:** Collaboration and support for projects. **Funding options for a potential railway project:** Availability of financial resources.	**Continuity:** Potential issues with maintaining long-term projects and policies. **Responsibilities of the regulating authorities**: Regulatory challenges and bureaucratic hurdles.	**The involvement of local communities**: Engaging locals for better project outcomes. **Cycling as a tourism product**: Promoting sustainable and attractive travel options.	**Car lobby issues**: Influence of the automotive industry on policy decisions. **Politicians' role for creating new tourism products**: Political challenges in implementing new initiatives.
	Cultural	**Awareness**: Promoting local culture and heritage. **A successful regional project example - Costa Navarino:** Demonstrates cultural and tourism potential.	**Stakeholders collaboration** **Problems at creating new products - The Wine Roads of Northern Greece:** Challenges in developing and marketing new cultural tourism products.	**Possible tourism products for Greece**: Expanding the range of cultural tourism offerings. **Cycling as a tourism product**: Integrating cultural experiences with cycling tourism.	**The culture of car use and cycling**: Societal preferences impacting adoption.
	Operational	**Effective rail transport strategies:** Optimizing rail operations for tourism and residents	**Stolen rails**: Security and operational challenges.	**Strategies for developing a railway network for better touristic experiences:** Enhancing overall tourism infrastructure. **Bicycle sharing systems**	**Railways in Greece - connection with other countries:** **Stolen rails:** Ongoing security issues affecting operations.

5. Discussion

The research question of this study is “What are the spatial and social challenges of the integration of railways and cycling tourism with the aim of lowering the impact on the environment while improving sustainability and regional development?"

Greece has many assets in terms of its natural resources (from beaches to mountains), its cultural heritage (from food and music to art and philosophy), its rich history (ancient sites) and much more, which attract visitors from all over the world. One of these assets is the Peloponnese Railway. The **revitalisation of this existing asset**, the Peloponnese railways, has the potential to revitalise the local economy through the provision of an **affordable means of transportation** and accessibility for the local population.

There is also an opportunity to extend tourist areas and the tourist season by combining this railway network with cycling tourism. This could help to counteract rural **depopulation**, by attracting both tourists and new residents. In addition, the integration of cycling tourism with the railways and the promotion of cycling through remote areas can also **create new economic** opportunities by creating new tourism products. **Local communities could be strengthened** and social cohesion improved by providing a wider variety of affordable, quality transport options, rail accessibility, cycling infrastructure and the potential for combining different forms of transportation. However, rail transport and cycling are two sectors that have been **neglected** and are in dire need of improvement. There are projects that demonstrate the potential for the preservation of **cultural heritage,** nature and the promotion of tourism at the same time. More projects may emerge, but their success is highly dependent on awareness of the topics with a **strong political will, receptive stakeholders, active community involvement and the responsibility of regulators**. Continued funding and political support are crucial for the development of new tourism products, which will depend on the existence of things ranging from cycling infrastructure to railway networks. The influence of the **car/bus lobby** is one of the most thorny problems. Among the political complexities involved. There is an urgent need for strategic planning which would favour other modes of transport, especially sustainable ones, such as railways and cycling.

Spatial challenges

Significant spatial challenges for the integration of the railway network and cycling tourism are mostly related to the existing infrastructure. While the region could benefit from the existing railway network, which could be revitalised, the current state of the infrastructure is in need of significant upgrading in order to accommodate cyclists as well as other passengers. Further complicating the integration of these modes is the lack of dedicated cycling infrastructure, such as safe storage facilities on trains and at the train stations and well-maintained cycling paths. Fortunately, there are opportunities to improve connectivity and create seamless transport networks, through the strategic development of railways and multi-modality efforts. However, there are also spatial issues that need addressing, including the current priority given to road transport investment over rail and cycling infrastructure, and climate change implications for cycling safety and viability.

Social challenges

The lack of a strong political will, stakeholder cooperation and the involvement of local communities are closely linked to the social challenges of combining rail and cycling tourism. The Peloponnese is an attractive destination due to its natural beauty and cultural heritage. However, political and regulatory barriers may delay the implementation of necessary infrastructure and tourism initiatives. The lack of political commitment in integrating rail and cycling infrastructure is a significant barrier, as is the need for cooperation between different stakeholders, including local communities, government agencies and the private sector. In spite of these challenges, there are opportunities to promote cultural tourism through the integration of cycling routes with rail travel, to improve social inclusion and to promote community development. Nevertheless, the need to overcome resistance from the car and bus lobby and to navigate complex bureaucratic processes is still critical to addressing the social challenges of this integration.

Environmental impact

There are both significant benefits and challenges to the integration of rail and cycling tourism in the Peloponnese. On the one hand, the promotion of cycling and rail travel as a sustainable alternative to car travel is in line with global trends towards environmentally friendly tourism, reducing carbon emissions and supporting the fight against climate change. This approach can have a positive impact on the protection of the region's natural resources and the long-term

sustainability of the environment. On the other hand, there are significant risks associated with threats such as overtourism and climate change. Too many tourists can strain local resources and degrade the environment, while extreme weather events, made worse by climate change, could make cycling routes less safe or viable. To ensure that the integration of rail and cycling tourism makes a positive contribution to the ecological health of the region, it is essential to address these environmental challenges.

Sustainability

In integrating rail and cycling tourism in the Peloponnese, sustainability is a key consideration. The region's existing railway infrastructure can provide a low-cost, sustainable means of travel that could support the expansion of the tourist areas and the extension of the tourist seasons. It can also stimulate sustainable economic growth through local business and job creation. However, the need for careful planning and consistent investment is highlighted by challenges such as the difficulty of developing new tourism products and the potential impact of economic volatility on infrastructure funding. The availability of funding for rail and cycling projects, combined with opportunities to promote cycling as an environmentally friendly mode of travel, offers a pathway to sustainability. To maintain progress in the long term, potential threats need to be addressed. For example, economic fluctuations could affect the sustainability of these initiatives.

Regional development

The Peloponnese has the potential for significant regional development through the integration of rail and cycling tourism. The region can stimulate economic growth, create jobs and support small businesses, particularly in remote areas, by revitalising the existing railway network and integrating it with cycling routes. The potential for tourism to contribute to regional development is demonstrated by successful regional projects such as Costa Navarino and the Spetses Mini-Marathon. However, the need for targeted strategies to ensure that the benefits of regional development are widely shared is highlighted by challenges such as rural depopulation and difficulties in creating new tourism products. Opportunities exist for the expansion of tourist areas and the extension of the tourist season through integrated transport solutions, but operational problems, lack of political will and bureaucratic delays could hinder the timely realisation of these benefits. In order to realise the full potential of rail and cycling tourism for regional development in the Peloponnese, it is essential to address these challenges.

This research is based on a multi-disciplinary approach to address pressing global challenges such as climate change, urbanisation and sustainable development. The perspective of this approach explores the spatial and social challenges of the integration of rail and cycling tourism, while providing insights into how transport systems can be redesigned to minimise environmental impacts while promoting sustainability and regional development. Hopefully, the study will be useful for policymakers, urban and regional planners and tourism developers interested in creating more sustainable and inclusive transport and tourism systems. It also aims to contribute to the wider discourse on sustainable tourism and regional development by providing practical recommendations for improving connectivity, accessibility and social equity. The findings of this study are significant because they highlight how these two modes of transport can complement each other to achieve environmental and socio-economic goals for a region; they also aim to identify critical barriers and opportunities in the integration of rail and cycling tourism. The study provides a comprehensive understanding of the factors that need to be addressed to create a successful multimodal transport system by highlighting specific spatial challenges, such as infrastructure compatibility and urban-rural connectivity, and social challenges, such as cultural acceptance and accessibility. It is hoped that by providing a reference for the development of sustainable transport strategies in line with regional development objectives, these findings can make a significant contribution to the fields of sustainable tourism, transport planning and environmental management.

However, the study does have limitations and these must be taken into account. The limitations include the fact that the findings may be specific to Greece and not universally applicable; they may even not be applicable across the entire country, has regions with a considerable degree of financial, geographic and cultural diversity; there may also be gaps in the data or case studies examined. For example, the integration of rail and cycling tourism may work well in certain regions with existing infrastructure and supportive policies, but the same approach could face significant barriers in areas with different cultural, economic or geographical conditions. In addition, the study could possibly measure or even predict potential long-term effects of climate change, such as wildfires, floods or water shortages and their possible unintended consequences, such as the displacement of local communities or damage to the environment. The above limitations, especially when the current analysis is limited by the lack of concrete

data on the practical feasibility of such a proposal suggest that there is a need for further research to test the applicability of the findings in different contexts and to explore different approaches in regions with different conditions. For more robust findings, a further study should focus on the feasibility analysis, including empirical data and assessment of practical challenges and opportunities.

Although many areas could not be addressed due to the broad scope of the topic and the implications of the findings are sufficient to show that the integration of rail and cycling tourism can play an important role in the achievement of sustainable development goals. For policy makers, the research underlines the importance of establishing supportive policies and regulations to facilitate the development of multimodal transport systems. In addition, the results underline that careful design and planning are needed for both functional and integrative infrastructure. The research also has implications for environmental and social sustainability. It suggests that addressing the spatial and social challenges identified can reduce the carbon footprint of tourism, stimulate regional economic development and improve the quality of life of local communities. To ensure the successful implementation of these initiatives, the findings also call for greater collaboration between stakeholders at all levels. Altogether, this study provides a basis on which, the author hopes, plans to promote sustainable and inclusive transport and tourism systems may be based.

6. Conclusion

Urban cycling proved its benefits for people living in the cities and the environment of the cities itself. These could also be used to benefit other areas in many ways and one of them is the tourism sector. Creating new tourism destinations helps in two ways: first, it reduces the pressure on the popular destinations and its negative impacts on these areas and second, it supports other areas with declining populations by offering livelihoods and sustaining cultural identity in them. Cycling tourism, with the integration of railways, the two modes of utmost sustainable transport, could create opportunities for achieving sustainable territorial development. Through them a new tourism practice and mobility of tourism can be rethought, without destroying nature and also by enhancing the welfare of local residents.

It is true that tourism is not the only tool for the development of rural areas, and mass tourism is not the only form of tourism. Tourism can be used for development by creating opportunities in areas such as improving agricultural production, supporting local services and preserving the cultural identity. Trains were once a symbol of development and modernisation. Back then they made our lives easier not just by connecting cities, towns and villages but also ideas and people. Today, despite all the plans when they were built, they are being replaced by roads. With the negative impact of cars on the environment and human health so obvious, what about strengthening them with cycling and making rail meaningful again? Doing so can contribute to rural and regional development.

With the aim of minimising environmental impact while enhancing sustainability and regional development, this study tried to explore the spatial and social challenges of integrating railway infrastructure with cycling tourism in Greece. After introducing the background of the topic, the first chapter took a look at the literature of regional and sustainable development, as well as the role of multi-modal transport in sustainable tourism through the focus of cycling tourism and railways. Four case studies across Europe have been presented as examples of this integration in order to analyse the effectiveness of combining the rail infrastructure and cycling tourism in promoting sustainable mobility, improving regional connectivity and supporting local economic development. These case studies provide valuable insights for the application of similar strategies in Greece by highlighting potential challenges and lessons learned through the different conditions of the regions. SWOT analysis has been used to demonstrate all this in a compact way. The following methodology chapter explained how this study is formed, how

the data was collected through interviews with the help of questions raised in the literature, then how this data was analysed through the case study in Greece.

The case study of this work is the Peloponnese region in Greece. The third chapter summarised current conditions in the country and the region under the issues of cycling, railways, tourism, sustainability and territorial development. The findings section is developed through the interviews and divided into three main themes (opportunities, a path to sustainable territorial development and challenges) with the aim of analysing all sides of the research question, which is "What are the spatial and social challenges of the integration of railways and cycling tourism with the aim of lowering impact on the environment while improving sustainability and regional development?"

In the fifth chapter, the spatial, social, environmental and sustainability challenges of integrating rail and cycling tourism in Greece were discussed. In order to achieve sustainable territorial development, the study emphasised the need for infrastructure improvements; both in cycling and railways, stakeholder collaboration; between governmental, regional and local parties, and of course political will. This study recognises the potential of this integration to stimulate local economies, reduce environmental impacts, improve social cohesion and protect cultural identities; but points out that there are constraints in terms of financing, political complexity and the influence of the competing transport sectors that are mostly supported by the decision makers. All these have to be taken into account with a solid feasibility study, to determine to what extend these propositions can be implemented.

A few different development models should be created for Greece considering its diversity in geography, infrastructure, social and cultural identities, and by focusing on the strengths of each of these. Since uneven tourism demand started being a problem and the country already has a railway infrastructure which is in idle condition, these models could position Greece as a destination for cyclists and environmentally friendly tourists. At the same time, through sustainable transport and tourism practices, it is also possible to design economic development-oriented interventions within the SDG framework.

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Annexes

Annex I - Car lobby examples from Germany and Italy

[DB FV (Deutsche Bahn Fernvekehr - German Railways intercity services)] has reportedly threatened to withdraw several long-distance routes[...] The threat of substantial cuts to both passenger and freight services has emerged following the announcement of significant increases in track access charges [in order to pay for lacking investment - S.Y.] (Keith Fender, Headline news, Today's Railways, issue 342, August 2024, p.6)

"[...] after decades of underinvestment the task [of tackling the maintenance backlog] is enormous and restoring public faith in the railways will require a sustained financial commitment [..] In Berlin there are signs that such commitment is lacking. [..] the federal government is planning to cut €1 billion from the rail infrastructure budget for 2025 to provide additional funding for road investment [...]

It is difficult to see how the loss of traffic to road can be avoided in this scenario - the exact opposite of federal government policy, which [allegedly - S.Y.] seeks to move more passengers and freight onto the railway." (editorial by Keith Barrow, Today's Railways Europe, issue 342, August 2024, p.5)

This is taking place in a country where the car lobby is still exceedingly powerful. In a contrasting example, Italy, where the car lobby is long past its zenith of power, is effecting the temporary closures of up to 60% of its network over the summer months of 2024 for heavy maintenance:

"In April 2024, RFI launched a €390 million framework agreement to modernise stations [...] In the first three months of 2024 contracts worth €5 billion were awarded for engineering works and over the next ten years Italian State Railways (FS) envisages investments of €200 billion [..]" (Marco Cacozza, Today's Railways Europe, issue 342, August 2024, p. 6)

Annex II- The distances from the railway stations to the main attractions in these four areas:

1 Corinth-Nafplion region

UNESCO World Heritage Site **Mycenae** and **Tiryns** (near the town of Nafplio)

Closest train station to Mycenae:

Argos:12 km, almost flat

Chiliomodi: 20 km (4km lightly steep, otherwise flat or downhill)

Nafplion: 20 km (4km lightly steep, otherwise flat)

Closest train station to Tirnys:

Nafplion: 4 km (flat)

UNESCO World Heritage Site: Sanctuary of **Asklepios at Epidaurus** and Ancient Theatre of Epidaurus (in Argolis)

Closest train station to Sanctuary of Asklepios:

Nafplion: 27 km (moderate climb towards Epidaurus)

Archaeological site of Nemea, Nemea Archaeological Museum and Wine routes of **Nemea**

Closest train station to Nemea:

Argos: 24 km (very steep at first, then flat towards Nemea)

Kiato: 30 km (10 km steep from Kiato to Nemea)

2 Katakolo-Pyrgos-Olympia region

UNESCO World Heritage Site **Olympia** Archaeological Site

Closest train stations to Olympia:

Olympia train station: 1,1km (mostly flat)

Pirgos : 20 km (almost flat)

UNESCO World Heritage Site **Temple of Apollo Epicurius** in Vasses

Closest train station to Temple of Apollo:

Issari: 35 km (almost downhill towards)

Elea: 35 km (4km gentle climb, otherwise flat or downhill)

Natura 2000 areas around **Killini-Kavasila**s and until Kiparissia

Closest train station to Olympia:

The coastline has many train stations

3 Kalamata-Messini-Pylos region

UNESCO World Heritage Site: medieval fortified town of **Mystras,** near Sparta

Closest train station to Mystras:

Kalamata: 50 km (half of the route is very uphill, the rest is downhill)

Leontari: two options: 52 km (almost flat) and 62 km (half of the route is steep and the rest is downhill)

Polylimnio Waterfalls

Closest train station to Mystras:

Kalamata: 30 km (20km flat and 10 km uphill towards the waterfalls)

4 Tripolis region

Mainalo Trail

Closest train station to Mainalo:

Tripolis: 38 km (first 10km flat and the rest uphill towards Mainalo)

Kapsia Cave

Closest train station to Kapsia:

Tripolis:15 km (downhill until the last 2 km, which are uphill towards the cave)