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A Grounded Theory Approach to the Transformation of Railway Sites in Türkiye

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Abstract

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This paper examines the obsolescence and transformation of historic railways in Türkiye, moving beyond conventional discussions of adaptive reuse. While existing research has primarily focused on the modes and strategies of repurposing disused railway buildings, this research investigates the broader processes of obsolescence, mapping the afterlives of railway heritage. It engages a grounded theory approach and systematically analyzes documents—maps, published articles, and local news—as primary data to trace how railway sites transition beyond their original function. It identifies key processes including expansion, abandonment, invisibility, and contested redevelopment and explores how ownership structures, policy shifts, and socio-political forces shape these transformation trajectories. This study situates these transformations across different historical periods, from the mid-19th century to the present, to develop a theoretical framework for understanding railway obsolescence in evolving urban, rural, and infrastructural contexts in Türkiye. The findings suggest a theory of “Relational Trajectories of Railway Heritage Transformation” and offer insights for heritage policymakers, planners, conservationists, and scholars engaged in transportation history, planning, adaptive reuse, and infrastructure conservation.

Keywords: Railway Obsolescence; Infrastructure Transformation; Cultural Heritage; Adaptive Reuse; Grounded Theory.

1. Introduction

Railways have played a crucial role in shaping urban and regional landscapes worldwide since the Industrial Revolution (Bogart et al., 2022). Beyond their function as transportation networks, railways are heritage sites that have structured regional topologies and influenced environmental perceptions. However, as transportation systems evolve, many railway lines and stations have become obsolete, disrupting spatial relationships, altering their role as connective infrastructures, and impacting collective memory (Amen, Afara, and Nia 2023; Aziz Amen 2022; Amen and Nia 2020). Kevin Lynch’s (1960) theory of urban form, particularly his concepts of paths, nodes, edges, districts, and landmarks, provides a useful framework to consider the spatial and experiential dimensions of railway networks. Railways function as paths that structure movement and connectivity across multiple scales, while stations serve as nodes where flows of people, goods, and information converge. Key railway elements such as buildings, bridges, and viaducts act as landmarks, shaping the visual identity of places and serving as reference points in collective memory. Railway corridors form edges, marking boundaries between urban and rural districts. When railway networks fall into disuse, these spatial and social functions shift, raising questions about their afterlives and transformation.

Globally, numerous railway lines, stations, tollgates, and warehouses have been underutilized or abandoned due to changes in transport priorities, deindustrialization, and shifting mobility patterns (Bianchi & Medici, 2023). The redundancy of railways arises from multiple factors, including technological advancements, functional obsolescence and economic and policy-driven changes. Technological advancements have rendered older systems inefficient or incompatible with contemporary transportation demands. Along these lines, highways, high-speed rail networks, and urban metro systems have displaced traditional railway use. Functional obsolescence has occurred as urban planning and mobility patterns have evolved. Economic and policy-driven changes have led to decommissioning of railways (Wong, 2023). In recent decades, the construction of more efficient roads and railways has further accelerated this decline, rendering older lines obsolete and leaving behind thousands of kilometers of disused tracks and abandoned stations (Bianchi & Medici, 2023; Spina & Lanteri, 2024). As railway redundancy increases, understanding obsolescence becomes crucial to identifying why certain elements fall into disuse and how they might be repurposed or reimaged.

Obsolescence theory (Baum, 1991) provides a framework to understand why and how railway sites lose their intended function. Baum (1991) classifies obsolescence into internal (endogenous) and external (exogenous) factors. Internal factors include physical causes such as material degradation, structural fatigue, and inadequate maintenance, as well as behavioral causes like changing transport demand or station closures. External factors encompass physical causes, including new infrastructure developments, environmental risks, and evolving regulations and standards as well as behavioral causes like tenant migration, social decline, economic depreciation due to new technologies and changing user preferences. In the scale of railways, internal obsolescence refers to railway infrastructure and structure—track and station deterioration, wear from heavy use, aging of buildings (physical causes) or shifts in transport demand, station closures, change in railway functions (behavioral causes)—and external obsolescence refers to urban and regional scale—new transport systems, urban expansion, or environmental risks (physical causes) and policy shifts, privatization, changing mobility trends, or economic decline of rail-dependent industries (behavioral causes). From the perspective of the effect, obsolescence is often understood as “the loss of a building’s performance over time and/or the last phase resulting in the end of the service life and most often demolition” (Thomsen & van der Flier, 2011, p. 353).

One consequence of railway obsolescence is the emergence of *terrain vague*, a concept introduced by Ignasi de Solà-Morales (1995) to describe ambiguous sites marked by uncertain ownership, planning deadlocks, and informal uses or a liminal period of a site before demolition, redevelopment, or reuse. Disused railway stations, tracks, and depots may present or stem from physical obsolescence (material decay, outdated technology) or behavioral obsolescence (declining passenger or freight use). Urban mobility changes, such as highway expansions or metro development, and economic transitions, such as industrial decline, can lead to location obsolescence, where former railway sites lose their relevance. During this period of dormancy, railway sites may host informal activities, like squatting, temporary markets, or artistic interventions, become subjects of heritage debates, or attract speculative redevelopment. Examining these varied trajectories helps elucidate the conditions that determine whether obsolete railway sites remain abandoned, are erased from the urban fabric, or are revalorized as heritage.

In Türkiye, railways have been integral to modernization efforts since the late Ottoman period (Demirci & Coşar, 2021). Railway heritage¹ has shaped the spatial fabric and environmental image of cities and rural landscapes. The obsolescence of historic railway sites in Türkiye has unfolded in parallel with global developments but is also shaped by local historical conditions, including empire-led and republic-led infrastructure policies, privatization trends, and geographical transformation dynamics. Many obsolete railway sites remain contested spaces, caught between abandonment, conservation efforts, and new development pressures. A large number of studies on railway obsolescence in Türkiye primarily focus on proposing adaptive reuse strategies for individual buildings. On the other hand, this study shifts attention to the broader theoretical framework of railway transformation. Rather than cataloging adaptive reuse approaches, it investigates the underlying patterns, conditions, and socio-political forces shaping railway obsolescence and transformation in Türkiye. Building on Köşgeroğlu’s Building on Köşgeroğlu’s (2006) classification of railway heritage into six categories—including infrastructure and signaling systems, structures, rolling stock and machinery, railway-related movable objects, associated environments, and archival materials (2006, p.20)—this study focuses particularly on infrastructure, structures, and spatial environments and calls this totality ‘railway sites’. Railway sites refer to buildings, lines, and associated structures that form the physical and symbolic network of rail infrastructure.

To systematically investigate these dynamics, this study examines the primary question of “How have the railway sites evolved in Türkiye?” through the following subquestions:

1. What are the pathways through which railways transition beyond their original function?
2. What are the predominant modes of transformation?
3. What processes or factors drive these transformations?

The research objectives include:

1. Contextualizing railway obsolescence in Türkiye;
2. Defining and classifying the temporal processes affecting historic railway transformation;
3. Identifying transformation patterns in historic railway sites and analyzing key factors influencing change;
4. Developing a conceptual and visual framework that illustrates how railway transitions beyond the initial function;
5. Providing insights for policymakers, scholars, and practitioners working with historic railway sites.

Overall, this study draws on urban form theory, obsolescence theory, and *terrain vague* to frame railway transformation as a spatial, functional, and socio-political process. It employs an inductive analysis of visual and textual sources—maps, scholarly literature, and news reports—to identify recurring themes and patterns in railway transformation. The study follows a grounded theory approach, detailed in the next section, followed by the presentation and interpretation of findings and the conclusion.

2. Materials and Methods

This study employs grounded theory, as a qualitative research methodology, to develop a railway transformation theory grounded in the historical and geographical context of Türkiye. Originally proposed by Glaser & Strauss (1967) and subsequently developed by Corbin & Strauss (1997) and Charmaz (2006), grounded theory does not commence with an existing theory but rather, theory emerges from and evolves within the research process. The grounded theory follows an iterative-inductive approach, where data collection and analysis occur simultaneously to refine emerging theoretical insights (Creswell, 2007, p.64). While the use of elicited data is common practice in grounded theory (Creswell, 2007, p.64), Ralph, Birks, and Chapman (2014) provide a strong foundation for using documents as extant data in grounded

¹ The term ‘railway heritage’ refers to the built and infrastructural elements of historic railway systems, including station buildings, lines, and auxiliary structures.

theory research. Charmaz employs the term “extant text” to indicate data sources that the researcher did not elicit (2006, p. 35). Based on Charmaz (2006) and Birks and Mills (2011), who argue that documents can be used as primary or secondary sources of data, Ralph, Birks, and Chapman (2014) further argue that grounded theory can be adapted to work with secondary sources, such as published articles and news reports, as long as the approach remains systematic, iterative, and theory-generating.

This research commenced with the search for documents on railway heritage and obsolescence in Türkiye. The researchers searched scholarly databases and the web by using Turkish and English keywords to identify any available sources.

Given the nature of the data, constructivist grounded theory (Charmaz, 2006) guides the analysis, allowing for flexibility in theory development and emphasizing historical, political, and economic contexts. However, systematic coding techniques (Strauss & Corbin, 1990, 1998) are incorporated to ensure rigor.

This research treats news articles, reports, policy documents, and academic papers as primary sources with data coming from these documents reflecting social, political, and historical realities. Instead of treating documents in isolation, the researchers analyze their context—the time, place, and intent behind their production—as needed, consider who wrote the texts, examine how different time periods reflect changes in railway transformation, and analyze underlying ideologies. Secondary documents often reflect interpretive framing by their authors. Thus, in this paper, the researchers code the raw content of documents and use constant comparison to let categories emerge naturally. The researchers analyzed several documents first, identified emerging themes, and then searched for more documents to refine or challenge the findings. When the researchers noticed a pattern, they sought documents that discussed counter-narratives. Thus, document selection was not predetermined but evolved based on the emerging insights (Figure 1).

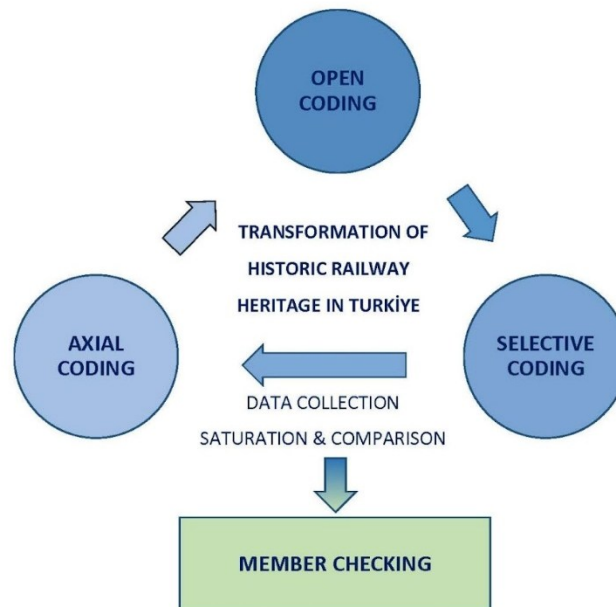


Figure 1. Research design (Developed by the Authors).

Initially, a diverse set of documents was selected to capture different perspectives: railway maps, government policies on railway heritage; news reports on railway heritage; and academic studies on Türkiye’s railway history and transformation. The researchers conducted open coding to establish the initial codes and identify key themes (Creswell, 2007, p. 64). Open coding focused on actions, processes, and discourses. Then, one core category was established in axial coding, and codes were organized into causal relationships between concepts (Creswell, 2007, p. 64). As analysis progressed, theoretical sampling guided the inclusion of additional documents to refine emerging categories. In the selective coding phase, the findings were organized into a coherent narrative explanation and a visual model (Creswell, 2007, p. 65).

The researchers planned to ensure the validity of the research by constantly comparing data across documents to refine categories and avoid bias, data saturation, and through member checking, in this case feedback from an expert in railway heritage in Türkiye.

3. Results

The research began with the collection of historical maps and scholarly manuscripts related to railways in Türkiye. Sources included open-access internet archives for maps and news articles, as well as academic platforms such as Google Scholar and the YÖK National Theses Center for theses and dissertations. A total of 59 theses and articles were identified through this search. Following a preliminary review, 29 publications were selected for closer reading to develop an initial understanding of the scope of scholarly work conducted on railways.

The initial readings revealed that railway heritage is related to several primary themes—including economic development, political and military strategies, infrastructural deficiencies, foreign investment and dependencies, historical, typological, and functional evolution, phases of development, the formation of lines, stations, and buildings, physical obsolescence, and modes of adaptation. These themes can be broken down into sub-themes and clustered

around the broader concept of topology. This thematic clustering enabled a wider understanding of the issue of railways in relation to broader scholarship.

The railway network in Türkiye was first developed during the Ottoman era. Four main railway lines that developed during the Ottoman era are railway in and around İzmir, Anatolian-Baghdad Railway, Hejaz Railway, and Şark (Rumelia) Railway (Figure 2). The railway in and around İzmir was built with British and French capital and served the interests of Western European investors, and they primarily served export interests by connecting inland agricultural areas to the port of İzmir (Doğan, 2016). The Anatolian-Baghdad Railway originated in Haydarpaşa (İstanbul) and stretched across central Anatolia toward Baghdad, and it was developed with German investment and reflected Germany’s strategic ambitions for economic and political influence in the region (Hasanbat, 2018). The Hejaz Railway began in Damascus and extended south to Medina, aiming to facilitate pilgrimage travel to Mecca and consolidate Ottoman control over Arab provinces, and the Hejaz Railway is a rare example of a fully domestically funded railway project, financed by the Ottoman state and public donations (Yıldız, 2008). The Şark (Rumelia) Railway is primarily located in present-day European side of Türkiye and the Balkans, including regions like Edirne, Thessaloniki, and Skopje, and it was constructed by Austrian companies through state-backed foreign loans, reflecting a mode of indirect imperial investment (Hasanbat, 2018). These maps reveal a tree-like topology—especially around export-oriented port cities such as İzmir—designed to transport agricultural products and raw materials from the hinterland to coastal export hubs while reinforcing economic dependency on foreign trade.

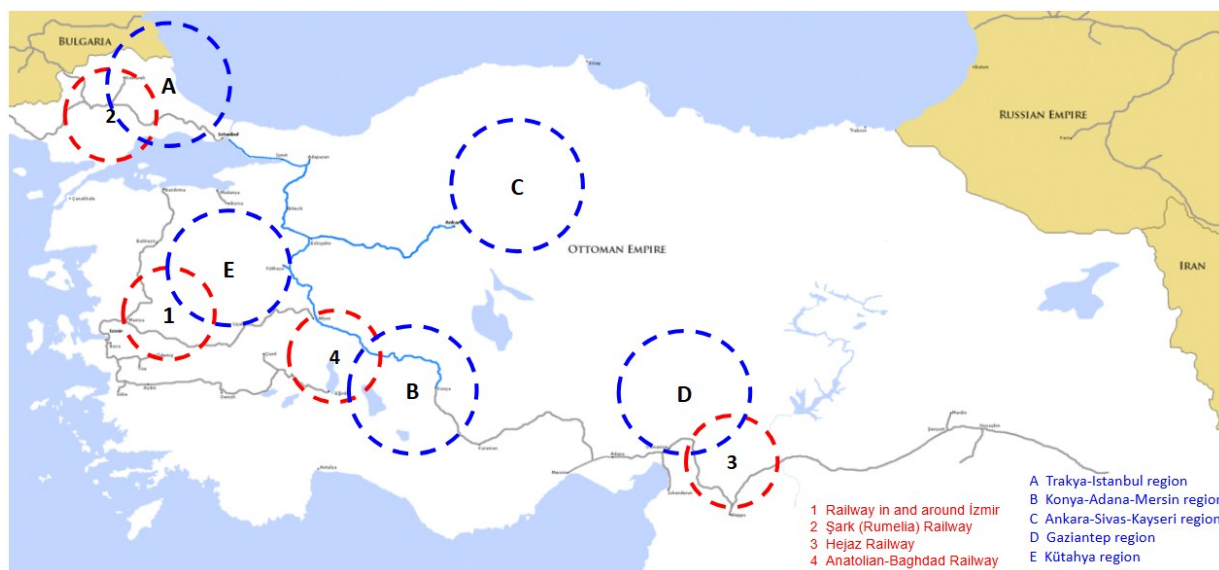


Figure 2. Initial regions of railway development plotted on a historical map of the Ottoman Empire. Adapted from Anatolian railroads in 1910 (CFOA in Blue) by Central Data Bank, 2012, Wikipedia (https://en.wikipedia.org/wiki/File:Chemins_de_Fer_Ottomans_d%27Anatolie.GIF). Licensed under CC BY-SA 3.0 and GFDL. Modifications by the authors.

In contrast, the reviewed scholarly literature on railway heritage in Türkiye is concentrated in five main geographic regions, and these are Trakya-Istanbul region, Konya-Adana-Mersin region, Ankara-Sivas-Kayseri region, Gaziantep region, and Kütahya region (Figure 2). These regions can be grouped into two categories: the first category aligns with historically rooted Ottoman-era railway zones, while the other category reflects areas where railway development occurred more recently in the Republic era. This suggests that academic interest is divided between documenting early infrastructural legacies and analyzing more contemporary regional railway growth.

This study’s preliminary focus on the Trakya region stems from both the density of available resources and the historical significance of the area in the broader Ottoman railway narrative. As part of the Şark (Rumelia) Railway network, Trakya was one of the earliest regions to be integrated into the Ottoman railway system, becoming a critical corridor connecting İstanbul to European cities such as Thessaloniki and Vienna. This made it a particularly rich site for preliminary investigation. In addition, the region benefits from extensive documentation, including detailed maps, academic theses, and heritage reports, which are relatively accessible through open-access platforms and national databases. The abundance of secondary sources and the presence of well-preserved railway heritage sites provided a practical and analytically fertile starting point for the study. By beginning with Trakya, the authors aimed to establish a strong empirical and historiographic foundation for subsequent comparative analyses in other regions.

The data analysis for a grounded theory of railway transformation in Türkiye commenced with the source-rich Edirne region. As opposed to the geographically more centrally situated railway network, it is a geographical edge condition that allows us to examine how border changes have impacted the use and abandonment of early Ottoman railway lines. For the preliminary analysis, two transformed historic branches or lines of the railway network and five key sites across those two lines (Figure 3) were identified:

1. Kırklareli–Büyükmandıra Line with Kırklareli, Kavaklı, Taşağıl, and Babaeski Stations;
2. Former Uzunköprü–Maraş–Edirne Line with currently outlying Karaağaç Station.



Figure 3. Abandoned and decommissioned lines and transformed stations of the Edirne region selected for the preliminary analysis. Adapted from TCDD Railway Map of Türkiye (2023), Turkish State Railways. Retrieved April 30, 2025, from <https://www.tcdd.gov.tr/>

Data analysis focused on data from maps, academic manuscripts, and news articles, organizing the key dimensions of transformation in relation to historical unfolding.

3.1. Kırklareli–Büyükmandıra Line and Its Stations

The Kırklareli–Büyükmandıra Line once functioned as a capillary in the national network—a path in Lynch’s terms—channeling raw materials into larger flows. This path, as an infrastructure, was the first to disappear from the railway network. It was dismantled due to political developments, wars, and military decisions despite local demand for the rail line, which was integral to the regional economy, reflecting Baum’s notion of obsolescence caused by both internal decay and external pressures. Although the line was later reconstructed, it served only infrequent uses, and its nodes were no longer actively maintained. With reduced activity, the stations gradually fell into disuse, entering what de Solà-Morales calls *terrain vague*: a liminal space marked by ambiguity, memory, and potential. To trace this transformation, the authors used a timeline method examining each station across three axes—formation, function, and recording—mapping physical changes, usage patterns, and how they were recorded and documented.

Kırklareli Station was partially in use until the 1990s and was later abandoned and partly collapsed during the 1990s. Around the same period, the heritage registration process was initiated, and within a decade, the station area including its auxiliary structures was designated as a conservation site. The transfer of ownership from the Turkish State Railways (TCDD) to Trakya University was carried out with a holistic approach, considering not only the main structure but also its broader spatial context. Academic studies conducted during this time may have influenced the decision to restore the building in 2000. The restoration was carried out with the aim of opening the site to public use and included a functional transformation aligned with its new role. Thus, early heritage listing, academic interest, and public events kept its memory alive, ultimately supporting its restoration and adaptive reuse as a cultural venue (Figure 4).

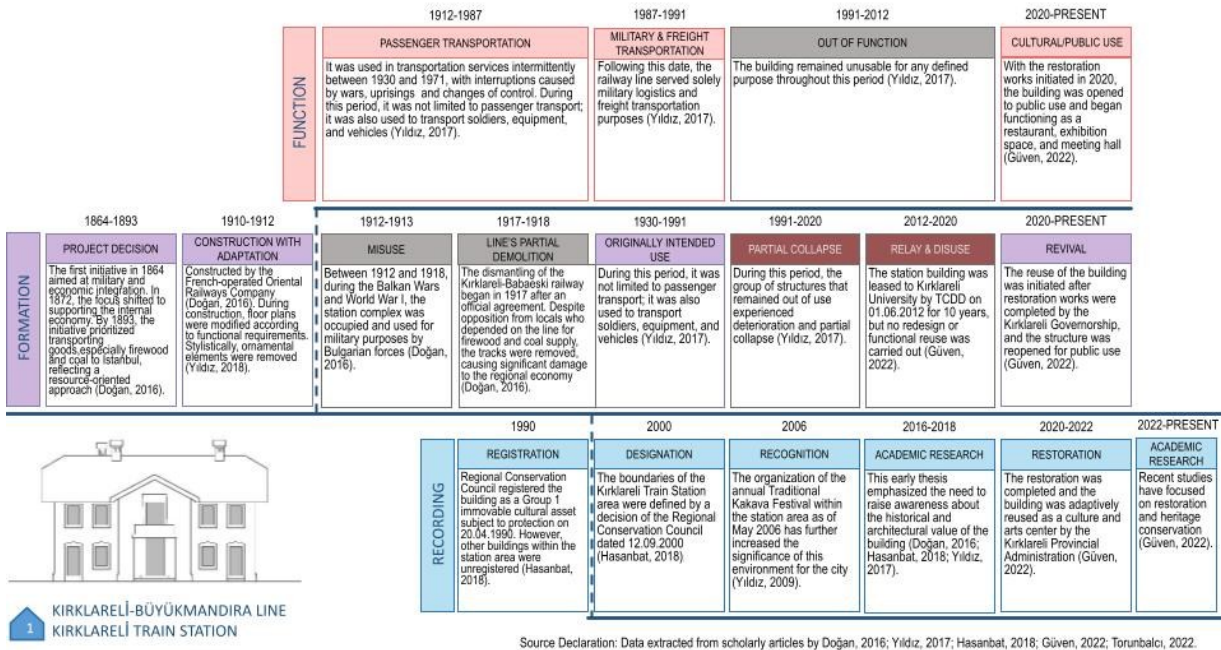


Figure 4. Transformation trajectory of Kırklareli Station (Developed by the Authors).

Kavaklı Station was abandoned in the 2000s, and partial demolition began before it was listed as a heritage site. Although a restoration plan was later proposed, it was never implemented. The process ended without reuse, as demolition had already started before any protective action was taken (Figure 5). The case of Kavaklı Station can be positioned between the two contrasting trajectories represented by Taşagıl and Kırklareli Stations. Unlike Kırklareli, which benefited from early registration and timely restoration, and unlike Taşagıl, which was never registered and eventually demolished, Kavaklı experienced a delayed designation process. By the time heritage status was granted, the site had already suffered partial loss. This intermediate condition highlights how the timing of intervention directly affects the extent of preservation and the possibility of reuse.

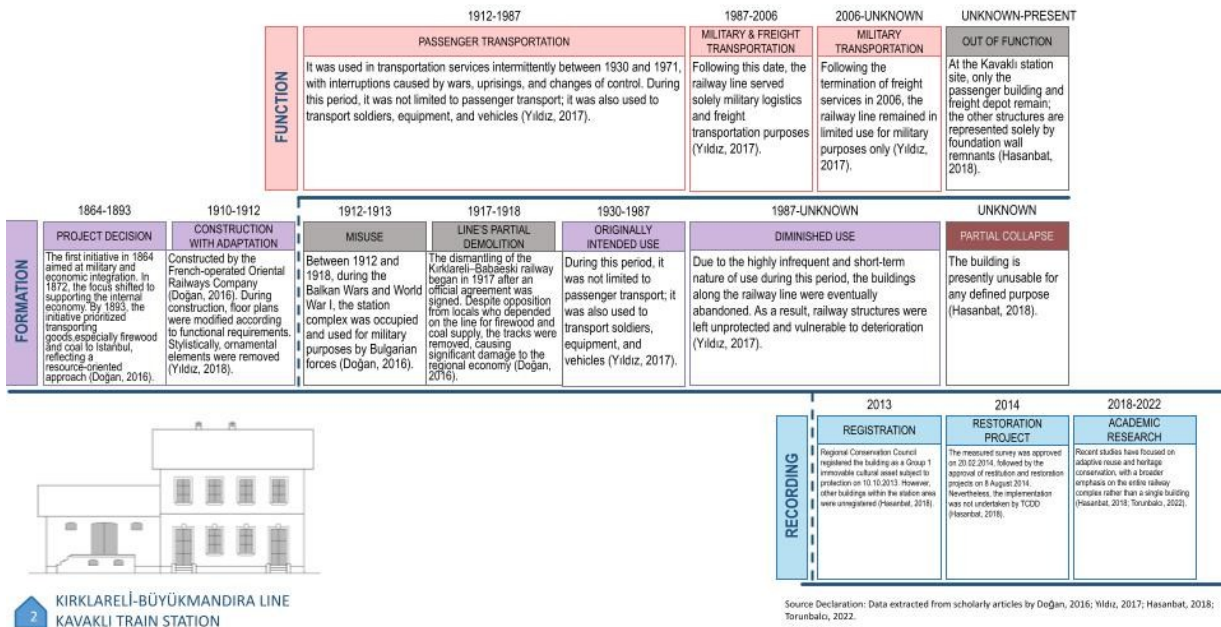
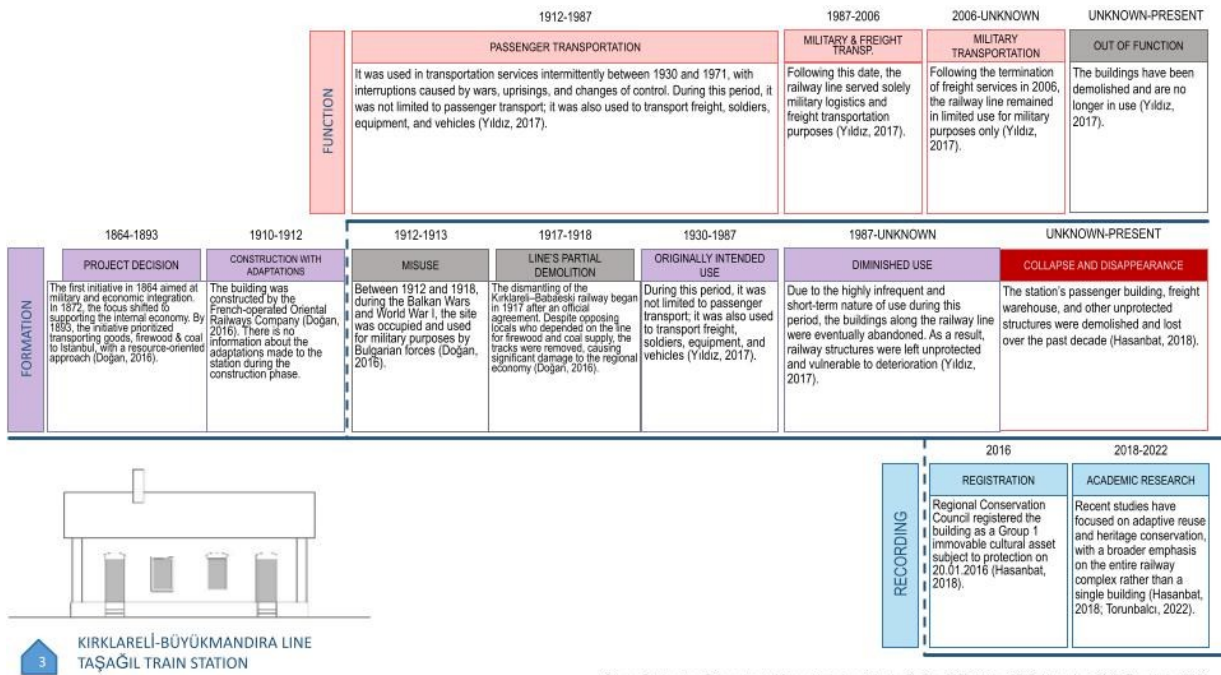


Figure 5. Transformation trajectory of Kavaklı Station (Developed by the Authors).

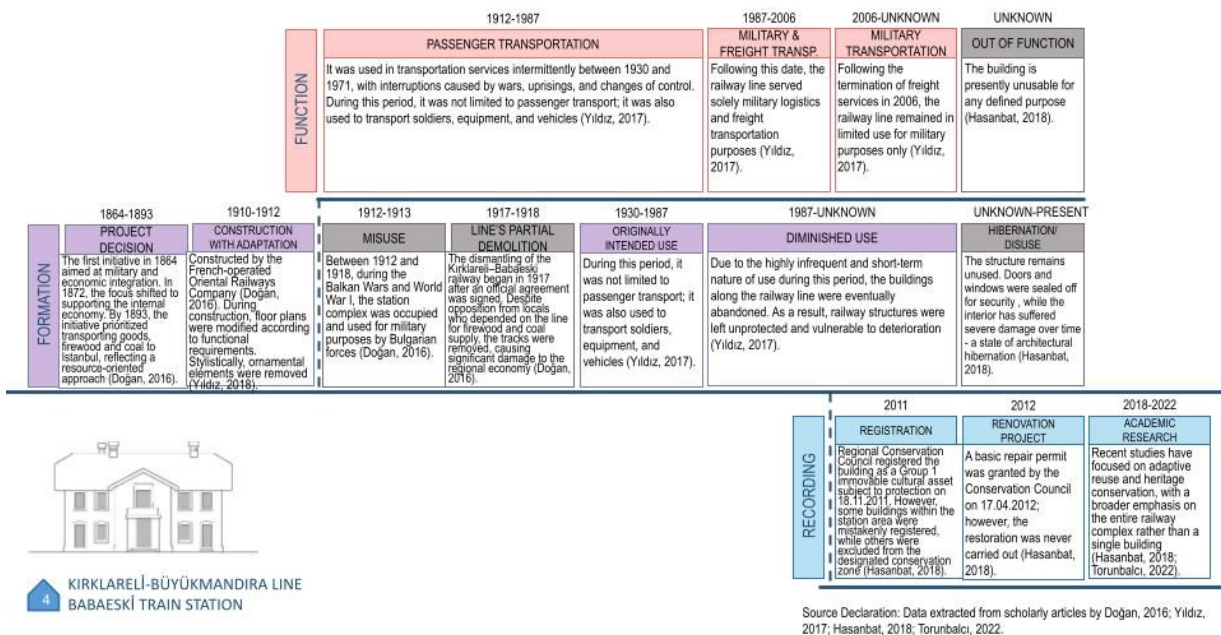
Taşagıl Station is demolished and erased from the collective memory. Its heritage listing came much later, in 2016, and no restoration plan or detailed academic study has been conducted. Since the building was not placed under protection prior to its destruction, the distinct characteristics of both the structure itself and its spatial context were disregarded. As a result, it is preserved in documents merely as a typological form. The absence of early records has accelerated its obsolescence and eventual loss (Figure 6).



Source Declaration: Data extracted from scholarly articles by Doğan, 2016; Yıldız, 2017; Hasanbat, 2018; Torunbalcı, 2022.

Figure 6. Transformation trajectory of Taşagil Station (Developed by the Authors).

In the case of the Babaeski Station, the process of decline was met with an earlier heritage registration, which prevented its demolition. However, instead of being reintegrated into a meaningful spatial or cultural framework, the building was sealed off—its doors and windows blocked—placing it in a state of architectural hibernation. As a result, it remains suspended as a detached and static form, preserved in isolation from its original context. It was listed earlier than Taşagil, and a renovation plan followed (Figure 7). These may have contributed to its partial survival.



Source Declaration: Data extracted from scholarly articles by Doğan, 2016; Yıldız, 2017; Hasanbat, 2018; Torunbalcı, 2022.

Figure 7. Transformation trajectory of Babaeski Station (Developed by the Authors).

3.2. The Former Uzunköprü–Maraş–Edirne Line with the currently outlying Karaağaç Stations

Karaağaç stands out as a unique case where the line itself was not just dismantled but completely re-routed. The case of the Former Karaağaç Station illustrates the strong influence of shifting borders and ownership on the development and obsolescence of railway infrastructure. The existence of four different station buildings within the same locality over the course of roughly a century² highlights the decisive role of border politics and territorial restructuring in shaping railway topology.

² There are photographs of a group of buildings constructed in 1872 on the site of the Karaağaç main station building, which have not survived to the present day (Torunbalcı, 2022). In 1971, with the commissioning of the Pehlivan köy–Edirne line, a new station building was constructed in the northeast of Edirne city center (Hasanbat, 2018).

The original railway was canceled, and a new line was constructed far from its original trajectory—leaving the Former Karaağaç Station, built in the 1870s, physically and functionally disconnected from the updated network. After becoming terrain vague, it was transferred to Trakya University, listed as a heritage site, and preserved through institutional support (Figure 8). The registration and transfer of the building occurred shortly after the 1977 line was built, allowing for its early renovation and continued use through multiple functional transformations. It now houses the Faculty of Fine Arts, which is an example of early recognition enabling sustained reuse. Its adaptive reuse into a university building both preserved its structure and reinforced its role in collective memory by transforming its historical identity with a new function. In Lynch’s terms, the line ceased to operate as a path, yet the station persisted as a landmark—a fixed point anchoring the memory of the old line.

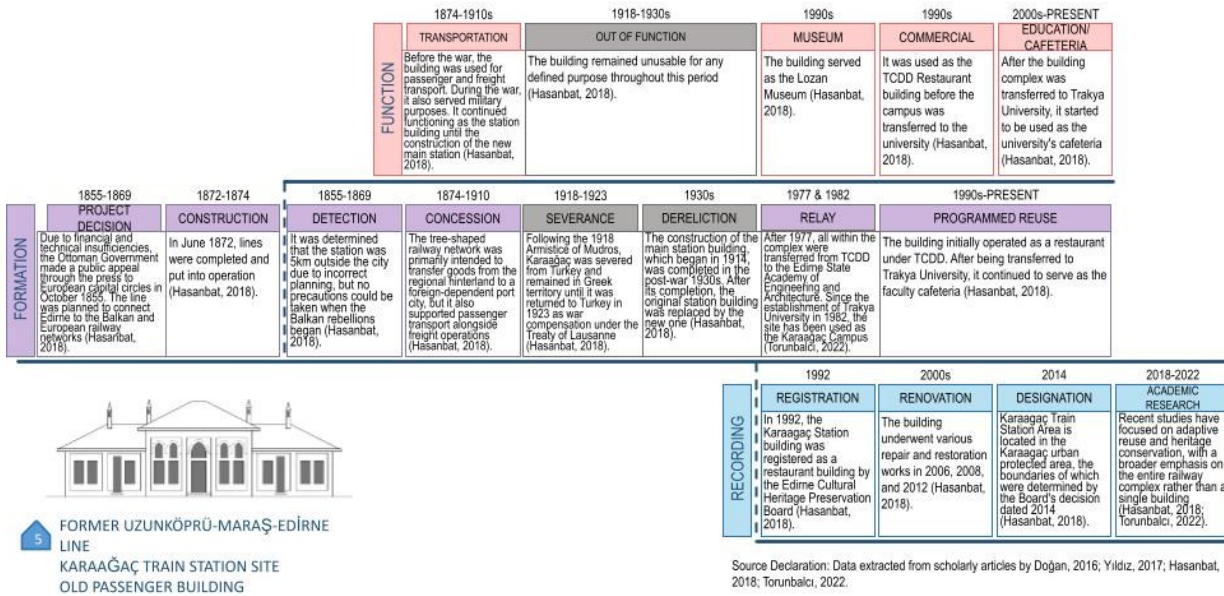


Figure 8. Transformation trajectory of the Former Karaağaç Station (Developed by the Authors).

The Karaağaç Main Station was originally built for military and logistical purposes and designed in line with the First National Architectural Movement. As one of the significant public buildings of its time, it was constructed near the earlier station, with a monumental form reminiscent of major European terminals. Despite offering limited service due to wars and shifting borders, its symbolic and architectural value led to early preservation efforts. Registration, repair, and transfer processes were initiated relatively early, and academic interest in the building also dates back to this period. As a result, adaptive reuse began earlier than in most other cases, allowing the building to remain in active use through multiple functional transformations (Figure 9).

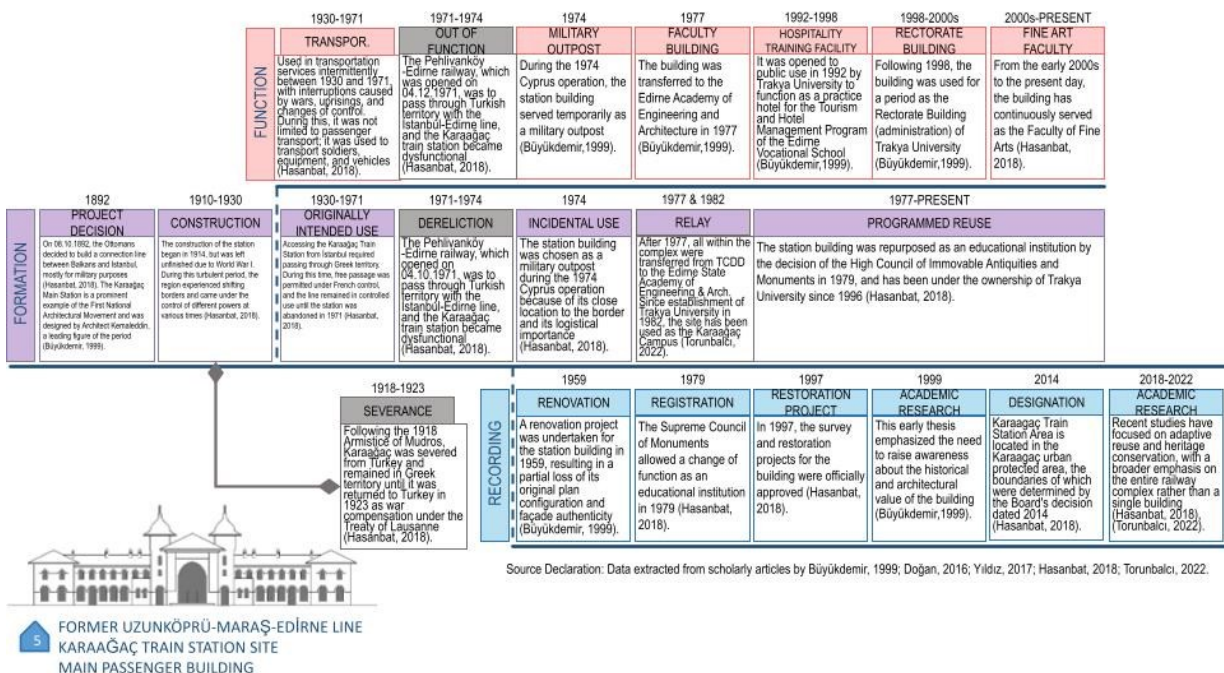


Figure 9. Transformation trajectory of the Karaağaç Station (Developed by the Authors).

Most auxiliary buildings in the Karaağaç complex were transferred to the university and repurposed after being listed as heritage in 2013. Today, they are used as studios, exhibition spaces, and cultural facilities. The only exception was the locomotive workshop, which remained unused for years and was mostly demolished. Its heritage listing came too late—in 2018—illustrating how delayed recognition can limit preservation outcomes. Except for the locomotive maintenance building, the other auxiliary structures and storage units within the Karaağaç station complex followed a similar transformation pattern. Following the adaptive reuse of the main building and the designation of the entire station area as a conservation site, all remaining structures were registered and gradually restored to varying degrees. Initially repurposed for educational support functions, these buildings were later adapted for cultural uses such as art studios, exhibition spaces, and a museum. This shift reflects a coordinated reactivation of the site, where formerly neglected service structures have been reintegrated into the campus through layered and programmatic reuse. Located at the periphery of the overall station complex, the locomotive maintenance building remained spatially and functionally detached from the main campus. Due to its original industrial function, it likely experienced faster physical degradation over time. Unlike the other auxiliary structures, its registration and transfer occurred much later, reflecting a delayed recognition of its heritage value. This trajectory suggests a common pattern observed in industrial heritage, where structures are often deemed less worthy of preservation. Its marginal position—both physically and institutionally—may explain its exclusion from earlier phases of adaptive reuse within the site.

4. Discussion

This study examined the transformation of historic railway sites in Türkiye through a grounded theory approach across multiple cases. This discussion draws on three key dimensions of formation, function, and recording to explore how temporality, institutional agency, and adaptive reuse intersect in shaping the fate of historic railway sites.

The analysis of two former lines and five railway station sites through open and axial coding reveals a complex relationship between temporal discontinuities, institutional decision-making, and the architectural trajectories of these heritage assets (Figure 10). Across cases, the emergence of key categories, such as abandonment, adaptive reuse, restoration, partial collapse, and registration, suggests that the fate of each structure was shaped by both its historical function and the timing and nature of its recognition and intervention. For example, Kırklareli and Karaağaç Stations, which were registered early and integrated into public or university use, followed a pathway of programmed reuse and sustained restoration. In contrast, Taşağıl Station, which lacked official protection, suffered total collapse, indicating a direct link between delayed recognition and physical loss. Meanwhile, Kavaklı Station illustrates a delayed rescue scenario where partial designation enabled limited preservation. These patterns suggest that institutional agency, particularly decisions by conservation boards, research by academic institutions, and actions by local administrations, played a central role in enabling the transition from functional decline to cultural repurposing.

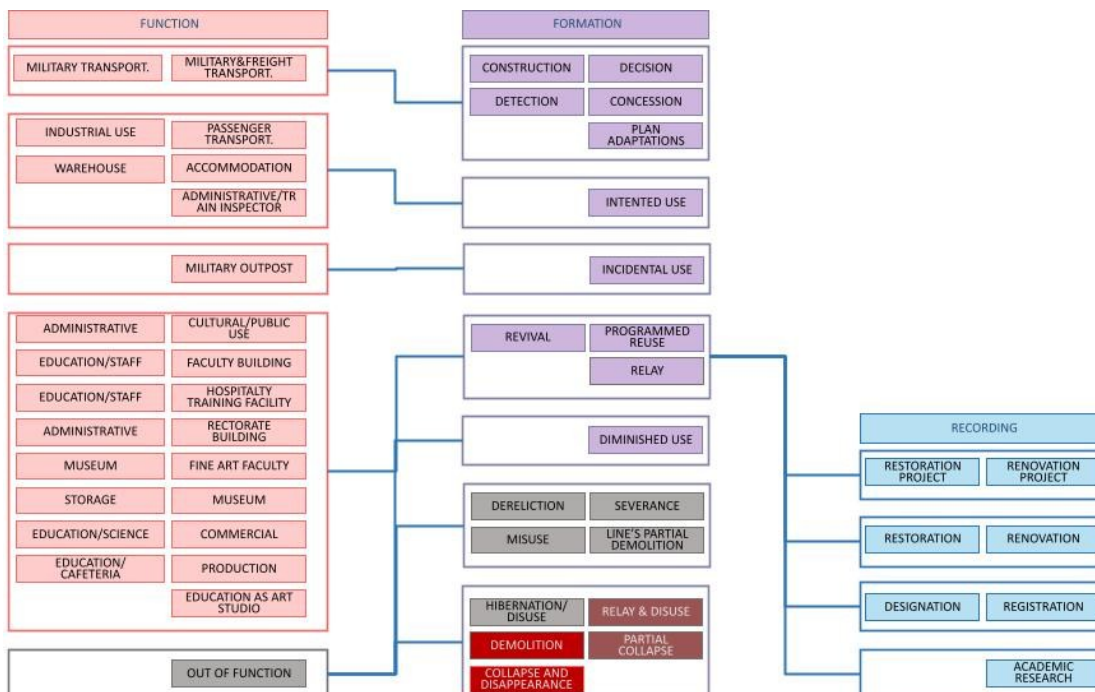


Figure 10. Relational trajectories of railway heritage transformation (Developed by the Authors).

The diagrammatic mapping of the results (Figure 10) shows a clear shift in functional identity of railway buildings from their original roles, such as military transportation, freight/passenger hubs, warehouses, or inspection offices, toward diverse contemporary uses. These contemporary uses include academic functions, such as education facilities, dormitories, rectorate offices, cultural and public programs, such as museums, art studios, and commercial or production-related reuse. This evolution suggests that historic railway architecture is not inherently obsolete but functionally flexible, and it is capable of supporting institutional, civic, and cultural life. Adaptive reuse in the studied cases tends to emerge where institutional actors, such as universities or municipalities, engage proactively with the site. However, where such agency is absent, stations often fall into disuse or decay.

The formation trajectory of these buildings often begins with planning, construction, and a defined intended use. However, as rail lines are severed, rerouted, or decommissioned, many buildings lose their infrastructural function, entering periods of incidental use, relay between agencies, or diminished operation. These transitions are rarely linear. Some buildings move fluidly between phases of hibernation, revival, and reuse, while others fall into dereliction, partial collapse, or disappearance. This non-linear progression shows the importance of seeing temporality not just as a chronological sequence, but as a variable influencing preservation outcomes. Crucially, the states of relay and disuse potentially lend into a stage that frequently precedes neglect or irreversible damage.

The recording dimension illuminates the mechanisms through which railway buildings are stabilized, revalued, or dismissed. Restoration and renovation projects indicate institutional commitment, often tied to heritage registration or academic research that generates visibility and justification for preservation. In multiple cases, academic studies catalyzed awareness and action. Consequently, the findings suggest that knowledge production and documentation are not passive reflections of transformation, but active agents of change, contributing to heritage legitimacy and intervention. However, designation alone does not guarantee survival of the heritage. Cases of registered yet collapsed buildings point to the need for timely, resourced, and context-sensitive preservation strategies that go beyond symbolic recognition.

Railway heritage trajectories emerge from the observations from the studied cases. Early recognition and institutional investment enable full transformation into cultural or academic facilities as in Karaağaç and Kırklareli Stations. Partial or late designation allows for some reuse but often after decay, as in Kavaklı Station. Buildings without protection or public interest deteriorate or disappear as in Taşagıl Station. Administrative dormancy occurs when ownership is transferred without functional integration, it leads to stagnation, as in Babaeski Station. These trajectories reflect how timing, recognition, and reuse agency shape the fate of built heritage. The earlier the intervention, especially one that combines registration, renovation, and reuse, the higher the chance of cultural continuity and architectural survival.

The preservation of railway heritage is contingent upon timely intervention, institutional agency, and adaptable reuse. Buildings do not simply age or disappear but rather they are acted upon or ignored, valued or dismissed, revived or replaced. Time is not neutral in this process; it is structured by political decisions, social memory, and material conditions. Through these findings, an emerging theory of relational trajectories of railway heritage transformation can be proposed.

While this study has largely analyzed the transformation of railway stations, the trajectories of the railway lines themselves reveal equally critical insights into obsolescence, infrastructural memory, and spatial politics. The dismantling, re-routing, or abandonment of these lines set the stage for the eventual fate of the stations, acting as a form of infrastructural severance that predates or precipitates architectural decline.

The Kırklareli–Büyükmandıra Line, once a local artery within the national network, illustrates a form of premature infrastructural disappearance. As a line, it functioned as a “path” in Lynch’s terms, organizing not only movement but also economic and spatial rhythms. Its dismantling, driven by military and political decisions rather than local needs, reflects Baum’s theory of obsolescence, where external pressures displace infrastructural relevance. Although the line was reconstructed, its function remained weak, lacking the integration needed to sustain its nodes. As a result, the connected stations entered terrain vague: spaces of ambiguity, memory, and unrealized potential. Here, the death of the line foreshadowed the decay of the buildings, underscoring that stations are not merely architectural entities but relational infrastructures, dependent on the vitality of the network they once belonged to.

The case of the Uzunköprü–Maraş–Edirne Line, particularly the Karaağaç Stations, reveals a different narrative. The line was not merely dismantled but rerouted across national borders, rendering the original stations physically disconnected and functionally obsolete. Unlike Kırklareli, however, Karaağaç endured, and its monumental architecture and symbolic position prompted early registration, academic interest, and sustained adaptive reuse. Yet even here, the line’s erasure produced a functional void: in Lynchian terms, the path was lost, but the landmark remained. This created a curious inversion—a station without a line, reprogrammed as a faculty building, cultural space, and memory site.

In both cases, the infrastructural continuity—or its absence—profoundly shapes the station’s trajectory and capacity for reuse. Lines shape not only traffic but meaning. Once severed, stations drift from infrastructure to monument, from node to object. This infrastructural disconnection becomes both a physical and symbolic rupture. The disconnection can lead to terrain vague conditions, where memory persists in absence of function, monumentalization, where stations become isolated landmarks, and layered reuse, where buildings are reinserted into new networks, such as university campuses, but severed from original flows.

Thus, the grounded theory of relational trajectories of railway heritage transformation must account for not only the building but also the line—the systemic connective tissue that governs infrastructural value. The earlier a line is severed, the more vulnerable its architectural components become to neglect, unless actively re-situated into new socio-spatial systems.

This discussion presented the preliminary results focused on five stations on two abandoned railway lines in the Edirne region. The authors plan to expand the results and discussion through iterative and comparative data collection and analysis through further cases across other railway networks in Türkiye. Subsequently, the authors plan to seek expert feedback to validate the results.

5. Conclusion

This study explored the transformation of railway lines and stations in Türkiye through a grounded theory approach by studying maps and academic sources. Focusing on two abandoned lines in the Edirne region and five associated stations, the research traced the ways infrastructural disconnection, institutional decisions, and temporality inform the current

status and future of railway heritage sites. The analysis looked into the architectural trajectories of individual buildings and the broader implications of line dismantlement and spatial severance, particularly in regions affected by shifting borders and geopolitical change.

This study examined the stations along the Kırklareli–Büyükmandıra and Uzunköprü–Maraş–Edirne lines, and this paper proposed a grounded theory of Relational Trajectories of Railway Heritage Transformation. This theory recognizes that the formation, reuse, recording, or disappearance of railway heritage is not the outcome of isolated factors but rather a relational process shaped by the timing of recognition, the vitality of the infrastructural network, and the presence or absence of institutional and academic engagement. Buildings and lines do not simply decay but rather they are made obsolete or viable through decisions, delays, and reconfigurations.

While the findings provide a detailed but focused account of the Edirne region’s railway heritage, they also reveal the need for a broader, comparative perspective. Future phases of this research will expand the study to the other regions across Türkiye and enable a more comprehensive understanding of how railway heritage transforms across varied historical and geographic contexts. The evolving theory will continue to be refined through iterative analysis and expert feedback to inform heritage policy and critical infrastructure studies.

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Conflict of Interests

The Author(s) declare(s) that there is no conflict of interest.

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