Swedish Railways and Cultural Heritage Research

Layers of Development and Reduction over 170 years

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Amongst comparable technological systems, the railway ranks highly both in terms of longevity, and the vigour of its continuous development over time. The presence of the railway system over such a long time-period has generated a vast and varied set of physical assets and socially interrelated processes, customs and memories. This longevity is very much the crux of the challenge in dealing with the cultural heritage of the railway system: How do we deal with the large and varied volume of material and data gathered over the preceding 170 years? In this article we present a framework for structuring the long development of the railway system, intending as a supporting effort towards analysing and serving, in practical terms, the preservation of railroad-related cultural heritage. The article brings onboard research from the cultural heritage field connected to the different time periods, and close out by discussing some important and relevant research questions for future investigation.

PURPOSE

The purpose of this article is to identify different categories of cultural heritage-research related to the long-term development of the Swedish railway system, from the middle of the 19th century to the present day. Initially, for framing and context, the course of development of the railway system is presented. The discussion is structured in four broad time periods and three functional categories. Furthermore, we discuss the gaps in the current research, and propose relevant, if not needed, further avenues of investigation. The article focuses on the built environment from historical, cultural and societal perspectives.

BACKGROUND

Many people have an emotional connection to railways being themselves travellers, and through relatives who still are, or have historically worked on the railroad. This is unsurprisingly in part a consequence of the size of the railway system and its organisations. By the middle of the 20th century, the National Railway Board (Statens Järnvägar – SJ) was the largest employer in Sweden with more than 75 000 employees in various positions within the railway organisation.[1)] In 2022,[2)] there were 244 million passengers travelling by train and 71 million tons of goods transported by freight trains in Sweden, compared to 1923[3)] when the corresponding figures were 63 million passengers and 32 million tons of freight.

Both passenger and freight transport on rail have lost market share to other transport modes. Passenger transport on rail has kept an important role, especially for regional and local transport, while freight transport on rail has lost considerable market shares to road transport and other modes except for the heaviest goods transported over long stretches. This huge system has generated a multifaceted number of buildings, rail tracks and other technical systems. Statistics of interest in this context are 253 listed buildings and facilities classified as National monuments *(Statliga byggnadsminnen and Byggnadsminnen)* and a huge number of buildings and bridges with cultural values.[4)]

There are some interdisciplinary overviews of the development and impact of the Swedish railways authored by researchers in the 1980s and around the turn of the millennium.[5)] There is also a huge number of publications from lay-men and practitioners regarding the railway system, though taking different approaches, mostly presenting very practical or local perspectives.[6)] However, what can be said of the state of research taking a cultural heritage perspective within academia?

The railways have affected the landscape and societal development in depth. Despite that, the cultural heritage connected to the railways is barely discussed and researched through that specific lens. In this article, we are primarily discussing the railway system from an infrastructural angle with a focus on the physical expressions of the railway system. Apart from this, it is also relevant to analyse the social and societal processes relating to the rail-infrastructure, with the transportation flows in focus, but also including all different aspects of human interrelation with the rail-system. These aspects do not, however, leave behind as apparent physical expressions as the infrastructure does, which is at the core of the cultural heritage definition with a focus on the physical expressions we are using here.

A map of railway lines in Sweden, Denmark and Norway in 1875. In Sweden the state-owned lines are in red and the private lines in black. From: Bidrag till Sveriges Officiela Statistik. L) *Statens Järnvägstrafik. 19 a. Trafikstyrelsens underdåniga berättelse för år 1880, Bihang. Kartor öfver utsträckningen af Sveriges jemte Norges och Danmarks jernvägar vid slutet af hvarje år under tjugufemårsperioden 1856–1880.*

Analysing a long-term technological system like the railways, and its impact on the physical (and social) environment, brings to the fore a number of aspects that are common to longitudinal studies.[7)] The physical infrastructure assets developed over time in the railway system consist of rail-infrastructure including buildings at stations, historically including gardens; dwellings for employees; maintenance-related assets; buildings directed at rail-system maintenance, and the maintenance of rolling stock. These parts of the railway system, as well as the industries connected to the rail system such as manufacturing focused on rail-system parts and/or rolling stock, together with primarily freight transport related interchange nodes (freight terminals, shunting yards etc.), all-together constitute an industrial heritage, which shares characteristics with other technological systems that likewise reflect the gradual growth of the general economy.[8)]

Over time, freight transport related parts of the railway system have successively been separated from the passenger transport serving parts of the system. For example, shunting yards have often been relocated outside cities, indeed stations and industries alike have become increasingly, physically externalised in their relation to the associated city area. Such industrial assets (buildings, facilities, plants, nodes) are also generally the subject of continuous alterations in the uses of land and assets. An overarching transformation takes place leading to a separation of different functions from the inner cities.

The part of the railway system focused on passenger travel is often more interconnected with cities, towns and villages, where the exchange of passenger transport flow occurs, when compared to freight transport. The traditional railway station has also often been the focal point when it comes to interest in preserving cultural heritage generated over time, while the supporting aspects of the railway system – such as maintenance facilities for cars and locomotives – have often been developed in mixed-use between freight and passenger flows, and has suffered a lesser focus, being regarded as less important parts of the cultural heritage and for preservation.

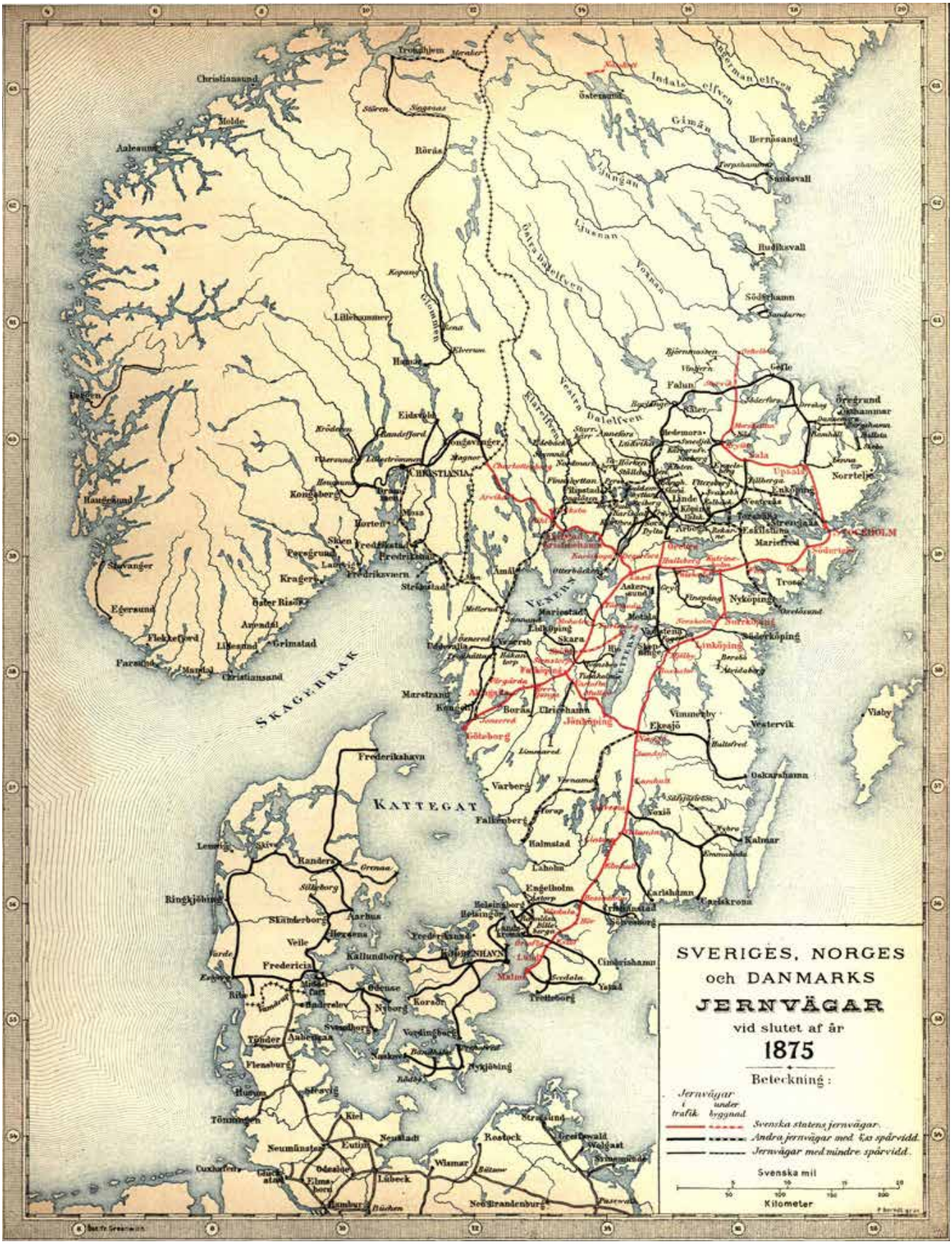
As railway stations have often been integrated with town landscapes and city centres, with many of the railway stations as high-class buildings with ambitious design and architecture, they have been relatively persistent over time with regards to societal changes. It might be that additions to railway stations have been made to accommodate increasing passenger flows and traffic, and to be able to supply new services to passengers, like shops, restaurants and so on, but older parts of the stations are often still in use, and merely adapted to new circumstances and needs. This utilisation may be very different from how the buildings were originally used, both internally and in relation to adjacent land, such as gardens, parking and so forth.[9)]

Following this way of describing the railway system as it has come to be, broadly speaking, we can identify three different classes of physical cultural heritage:

- The rail (track) system, primarily outside cities.
- Facilities serving freight transport and the railway system.
- Facilities serving passenger transport.

Furthermore, it could be argued that the three classes express different aspects of cultural heritage. The rail system outside cities as examples of *engineering history;* bridges, tunnels, electrification, and technologically related assets for the steam engine era (water-cisterns, coal-storages, etc.). The rail tracks in general also represent an intrusion in to the landscape, but also provides an understanding of the transportation systems' development, and the way the railway system has worked over the years, with flows of transportation changing over time.

The facilities related to the maintenance of the railway system and freight functions are more connected to *industrial heritage* at large, which naturally includes a myriad different structures. The railway system represents an important stage in the gradual development of the industrial economy and society, and the still-standing assets can transfer an understanding for how industrialisation played out over time; restructuring land-use and adding new assets, buildings and facilities, all set further apart from cities over time. Today these older buildings, objects and facilities might be in different modes of decay. This is a central obstacle facing the preservation of industrial heritage at large, bringing into the endeavour


SVERIGES, NORGES
och DANMARKS
JERNVÄGAR
vid slutet af år
1875
Beteckning:
Jernvägar i trafik
under byggnad
Svenska statens jernvägar.
Andra jernvägar med 4,5 spårvidd.
Jernvägar med mindre spårvidd.
Svenska mil
Kilometer
SKAGERRAK
KATTEGAT
VENERN
VETTERN
MÄLAREN
CHRISTIANIA
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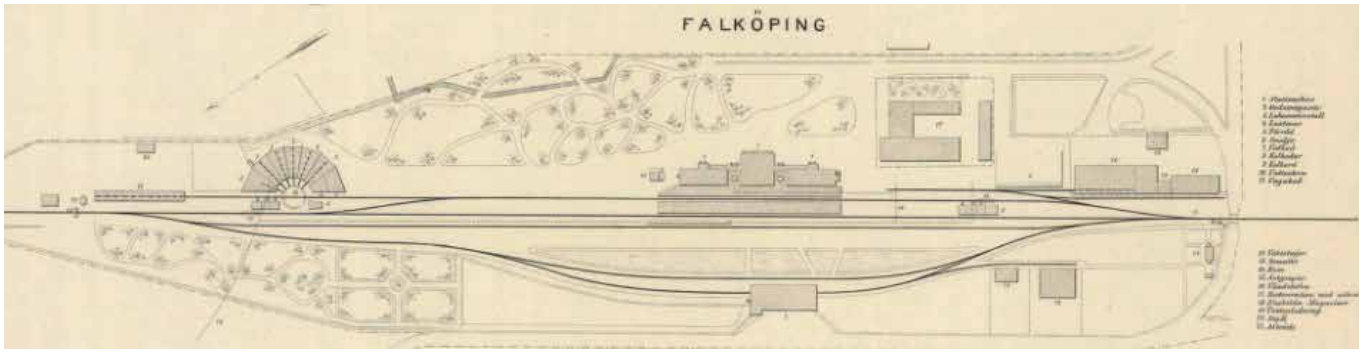


The station area at Falköping as an example of what sort of buildings, facilities and gardens that was created along the lines. From: *Teknisk-Ekonomisk beskrifning. Svenska statens Jernvägsbyggnader. I. Vestra stambanan, "Stockholm-Göteborg", med utgrening till Örebro,* Stockholm: Iwar Hæggströms Tryckeri 1868.

high costs, a danger of accidents, and often environmental pollution – the latter rendering alternative uses of industrial landscapes very expensive.[10)]

Railway stations and other parts of the railway system specifically provided for passenger transport are usually, as noted above, more often integrated into the urban fabric. This means that the buildings are visible to a higher extent than the other parts of the railway system, and that the questions that relate to these are part of a wider *urban planning and place-making discourse,* where the cultural heritage aspects are often at the fore. The central location of railway stations often leads to a high development-pressure on these in times of urban renewal, as the land-value is generally high and drives regeneration. For other sections of the railway systems; formerly utilised stations, gardens, and facilities may have become obsolete from a transportation point of view, since railways have been redirected, or due to decreasing traffic volumes following closures of stations, and a downgraded rate of maintenance as an effect. This latter situation may prompt voluntary actions to rescue old(-er) buildings from further decay and possible demolition.[11)]

FOUR PERIODS OF RAILWAY DEVELOPMENT AND RELATED CULTURAL HERITAGE STUDIES AND RESEARCH

In this section, we offer brief descriptions of the most important aspects of the different time periods of the railway systems' development and retraction, as regards the cultural heritage produced over time and often still in use or preserved today. The organisational and financial principles have often affected the setting of the system, including with regards to what kind of buildings and other physical expressions that have been added to the system. We begin our study when planning for the first mainlines began, but there are also older rail-bound transport systems whose cultural heritage deserves to be analysed.

Establishment 1850-1900

The establishment of the state railways was surrounded by an intense political debate – how to finance, by whom, and where to place the new transport system's different parts; stations, rail tracks and auxiliary facilities like maintenance and shunting buildings, all in relation to various interests at play. Taking influences from England, Germany and other countries, collected through educational journeys and literature; techniques, know-how, and materials were imported to Sweden. The organisational and staffing skills largely originated in the construction of the canals, e.g., *Göta kanal* and *Trollhätte kanal,* and the military organisation.[12)]

The railways played an essential part in the industrialisation and modernisation of Sweden. Modern project-ideals regarding preferred development, as expressed by the leading layers of society regarding education, discipline, and cultivation of land and human resources, were brought into practice with the help of the railways. The state wanted to showcase a model for architecture and cultivation, and connect the nation in a way that had not been possible up until that point. The structuring role of the railways in societal development cannot be emphasised enough.[13)]

The new railway system was in the beginning limited to the middle and southern part of Sweden, but after an initial phase with focus on south and mid-Sweden, the plans and construction continued northward. Previous research has often emphasised the roles of a few pioneers and leading persons for the realisation of these projects.[14)] It would be interesting to also include the more numerous groupings of people and staff who were engaged in the establishment projects. Many of these people found themselves favoured by the projects financially, it serving as means of acquiring an income, but the projects also involved many challenges for the staff and their relatives, what with diseases, accidents and unfavourably dispersed families constituting a darker side of the large railway projects.

From the very first beginning of the establishments of the main lines in 1855, one architect was hired for the Western Main line *(Västra Stambanan)*, and another one hired for the Southern Main line *(Södra Stambanan)*. The historiography has paid a lot of attention to the first one, Adolf Edelsvärd (1824-1919), who became the head architect for the state railways from 1856 to 1895.[15)] The other architect is overlooked in research so far, in fact his name is not even known. Some minor studies have been made regarding the architecture of the private lines, but we still lack comprehen-

A lineman cottage, number 26 at Gunnarp in Skåne, in the 1860s with its kitchen garden on the left side. In the background a mill and in the middle several people, including three children, are lined up. From: The Swedish Railway Museum, JvmKDAA02321.

sive knowledge of long-time structures and change in design ideals, organisation, collaboration, and so on. In addition to that, almost no studies have been made of the gardens adjacent to stations that belonged to the private lines.

The main lines began forming from Gothenburg and Malmö heading towards the capital city of Stockholm. By the end of 1856, the first parts of the main lines were inaugurated – Malmö – Lund, and Gothenburg – Jonsered. A few years later, in 1862, the Western main line was completed from Gothenburg to Stockholm, and the Southern main line from Malmö to Falköping, inaugurated in 1864, providing connection to the western line. The architect office produced drawings for the buildings; the design of the rails and technical assessments were made by engineers, and local gardeners were hired to arrange the gardens. Each section of the railway was led by a "Station Engineer" *(Stationsingenjör)* who organized and hired staff for the construction and gardening, and also requisitioned all the materials and support services needed for the effort.[16] Apart from the organisation of the State railways on a national level, studied by Berggrund & Bårström 2014, the involvement and cooperation between different actors in the local society in the building process has not been studied in similar detail so far. A significant, unresearched field is the role played by women; in general, in railway families, as salesmen of different goods and services, as navvies, and so forth.[17]

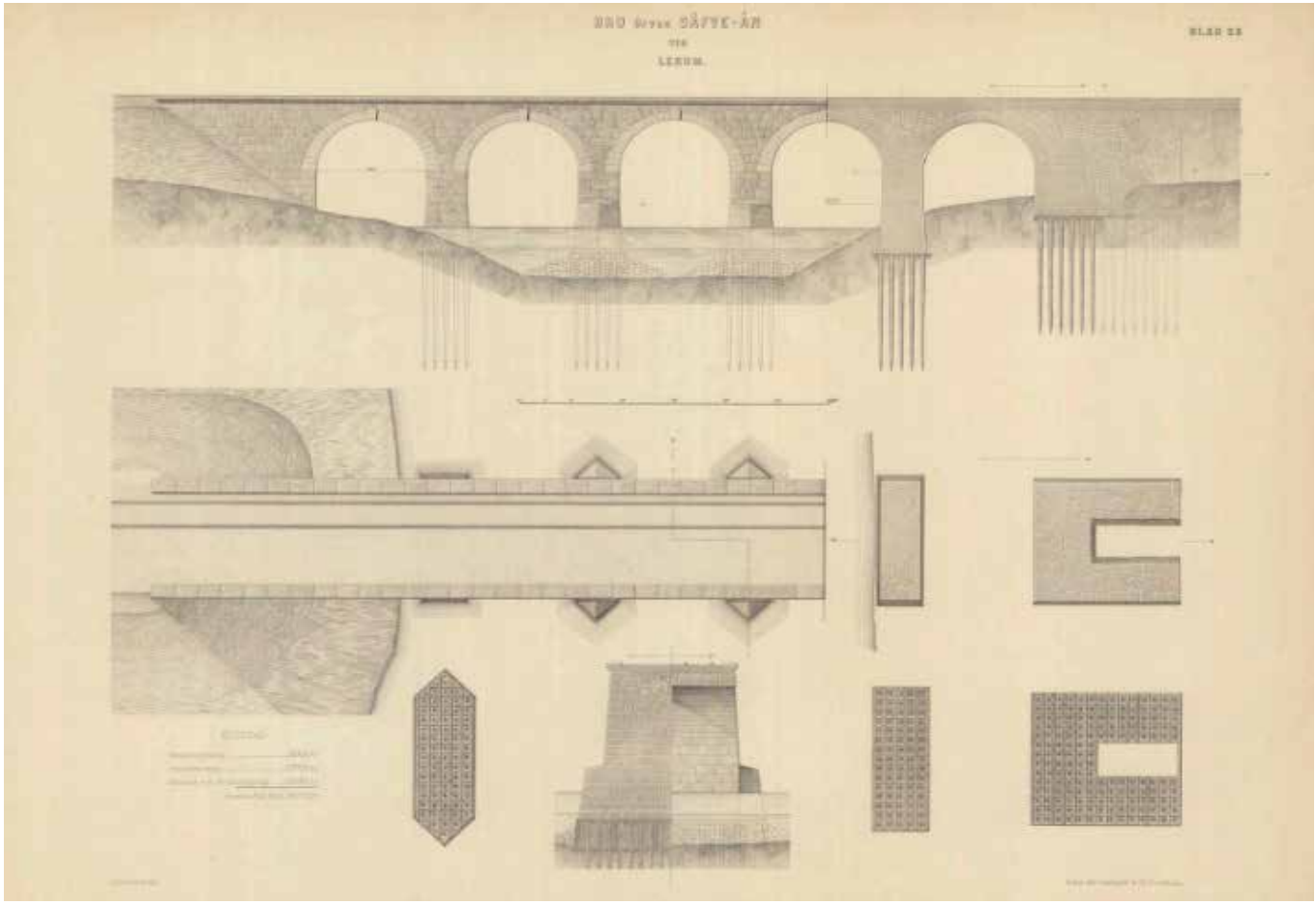
Early industrial railways and freight transport have not been studied to the same extent as the history of the main lines and passenger transport. We know quite a lot about trains and transports on the rail-system, but not so much about senders and recipients and the built facilities that were parts of the freight transport system. Studies have been made in relation to specific stretches and railways connected to industrial facilities, but the more general picture remains to be analysed and described.[18]

The built environment characterised many places with its station areas, which included a lot of buildings and technical facilities. In addition, extensive gardens and plant nurseries were established to provide the railway with plant material for ornamental, shelter and household needs.[19] The railway connected places and regions, even countries. The landscape was, as a result, transformed in a comprehensive way, and a lot of new places where exchange of passengers and freight goods occurred were established. New meeting places were created in station buildings, with restaurants, wagons and gardens adding to the traditional places for exchange. News from the surrounding world reached towns and villages with newspapers, mail and people transported by the train, with a frequency and speed that had not been the case earlier. Even a national time-keeping standard was established in the end of the 1870s with a basis in the needs of the railway system.[20]

The construction of the rail-lines outside the cities, where most people were affected by the new facilities relating to the railways, was very often a challenging process, supposing major excavations to provide for stretches of canals, the establishment of bridges and tunnels, all to unprecedented extent within Sweden. Only the major canal-projects, primarily *Göta kanal,* had had a size even remotely close to the grandeur and complexity of the railway construction. Roads had been constructed for a long time in Sweden, but the size of such projects had been less grand. Along the rail-lines in the countryside the railroad system introduced a new structure to the landscape, reducing the number of free passages across the terrain, but also leaving obvious landmarks, which are often apparent even today. The railroads, indeed, signalled that a new era was coming: An era of engineering and major man-made structures that altered the landscape and the way people interacted, or were directed by the system to interact.

This painting, by the artist Albert Blombergsson (1810-1875), is showing the first station area in Gävle built by Gefle Dala Järnväg (GDJ) in the 1860s. Notice the station building, the hotel, and the warehouse in the background and the engine house and the green area in the foreground. From: The Swedish Railway Museum, Jvm11775-1.

One study which exemplifies theoretically based research concerning a major railway stretch established during this timeperiod, but also covering later periods, is *Åkdon, blick och landskap. Om relationer mellan kommunikationer, kulturmiljö och landskapssyn med huvudexempel från Kullahalvön, Skåne* (2020) by Henrik Ranby, researcher in conservation. Another study that stands out is *Stationshus – Järnvägsarkitektur i Sverige* (2010) by Gunilla Linde Bjur, architect and researcher in art history.[21] As stated above, these are, though, two of only a few, similar examples with this cultural heritage as research subject.



Drawings to the bridge at Säfveån. From: *Teknisk-Ekonomisk beskrifning. Svenska statens Jernvägsbyggnader. I. Vestra stambanan, "Stockholm-Göteborg", med utgrening till Örebro,* Stockholm: Iwar Hæggströms Tryckeri 1868.

The station and transformer building in Vassijaure, along the line from Kiruna in Sweden to Narvik in Norway, was built in the 1910s and is safeguarded as a National Monument (*Statligt byggnadsminne)*. From: The Swedish Railway Museum, JvmKDAA02321.

Maintenance 1900-1950

During the first part of the 20th century, a lot of effort was given to maintenance and improvement of the railway system. This entailed major additions to the existing railway system such as electrification and building of double tracks, but fewer additions with regards to the length of the system, although the Inland line *(Inlandsbanan)* stands as the exception to that. The electrification of the railways started in 1910s in the very north of Sweden, deeply studied by Viklund 2012. In Viklund's dissertation, the major construction works necessary for incorporating the electrification technology, co-built with station buildings, is analysed, primarily from a technological rather than a cultural heritage point of view.[22)] How the electrification of the railways, beside style ideals, affected architecture and the design of facilities in parts of Sweden other than the north has though not yet been studied in a comprehensive way. The Inland line, which was inaugurated in 1937, was the last major railway project, managed by the National Railway Board (SJ) during this period. The history and architecture of this line has been described in a report by the National Heritage Board *(Riksantikvarieämbetet)*.[23)]

In 1939, it was decided by the Parliament that all important railways should be transferred – on a voluntary basis, but effectively without any alternative – to state ownership and management, which meant that the state incorporated 7,000 kilometres of railway, previously owned and managed by private and local railway companies. The idea behind the nationalisation was to reap coordination gains and rationalisation effects in the railway system. This took place during a situation in which several railway companies experienced financial problems, brought about by competition from road vehicles and sometimes also by deferred maintenance.[24)] Incorporation of the private lines, with its different characters of architecture and design, have been studied primarily from an economical-historical perspective, but not as much from a cultural heritage perspective.[25)]

A wide variety of different materials have been used in the railway facility and rolling stock like metal, wood and paint, and is in many cases still in use, but there exists as of yet just one single study with a cultural heritage and conservation perspective focusing on the use of different materials. In the dissertation *Painting Treatments of Weather-Exposed Ferrous Heritage. Exploration of Oil Varnish Paints and Painting Skills,* Arja Källbom investigates how anti-corrosive oil varnish painting can be used in the maintenance of ferrous heritage. The starting point in the study is the industrial heritage and the railway heritage, and paint used from the 1920s and a couple of decades beyond.[26)]

During the Maintenance-period there was an interesting example of expressing the ideal of furthering public education, with had its roots in the 19th century: The National Railway Board (SJ) hired landscape historian Mårten Sjöbeck, with the position as an Agency director. Between the years 1928 to 1950 he published a series called The Mainlines Landscape books *(Statsbanornas landskapsböcker).* The books expressed an ideal of nature, culture and travelling in a context of education. This, and the educational orientation of the SJ Director of Gardening Gösta Reuterswärd, is studied by Johan Bergkvist in a licentiate dissertation 2013.[27)]

Kiruna as an example of a well organised and maintained station area with technical facilities like the water tower in the middle. Notice the well-mowed lawns and manicured gravel surfaces, the planted trees and hedges, and the houses to the employees in the background. Photo: T Dahllöf 1928. From: The Swedish Railway Museum, JvmKDAA11273.

SJ bus-operations in Funäsdalen, in the north of Sweden. Photo: Lennart Nilsson 1956. From: The Swedish Railway Museum, JvmKBDB16832.

Reduction 1950-2000

In the second half of the 20th century, the development of railroads in Sweden was characterised by two major changes: On the one hand, the finalisation of the nationalisation of the formerly privately owned railroads, as described above. On the other hand, the continuing and successively stronger development of road transport as a competitor to the railway system, for both freight and passenger transport. Combined, these two development paths meant that a strong pressure for change and increased effectiveness of the railway began significantly affecting the railway system.

Nationalisation of the railway reached its conclusion during the 1950s. A huge number of local and regional railroad-stretches, that had up until this time been built and managed by local corporations, often partly owned by the municipalities and industries in the regions, were transferred to the National Railway Board (SJ). Generally, these local and regional railroad companies had been built based on a government concession, which also generally was combined with government loans and/or grants. There where thus a complicated web of relations between the railroad companies and the government to sort out as the ownership was changed, and negotiations unfolded regarding the timing of transfer, and the price the state should pay for the assets and operations.

One of the difficulties relating to the combination of the formerly separated railway organisation was differing technological solutions. The gauge of the tracks was in many cases different and the capacity that the different railroad systems could transport in length and weight was also varying. Electrification was implemented to a varying extent. This brought an increased complexity to the railroad operations of SJ, and a need for organisational change and increased streamlining of the operations.

The competition from road transport (buses, cars and trucks) grew strongly from the 1950s on. SJ was also involved in these business lines, by operating both a network of buses and road freight transport services. That the state-owned transport operations should function in a setting of competition between the transport modes was part of the transport policy decision of 1963,[28] which was the result of a series of government investigations into handling the major infrastructure systems following both World War II, and the nationalisation of roads and railroads in the 1940s and 50s. For the railroads, the 1963 transport policy decision also meant that direct government support was to be extended to SJ to cover the deficits generated by the unprofitable parts of the rail network. The overall policy was, otherwise, that SJ should be operated as a utility institution, covering its costs by revenue extracted from the users of the system. Public response to closures was frequently negative, and SJ had difficulties explaining and defending its business-economically based decisions. The formerly strong position SJ enjoyed as "the railway of the entire people" *("Hela Svenska folkets järnväg")* was suddenly turned into a dilemma, as the idea that the railways were to be kept and operated "for the people" made the necessary reductions and closures even more controversial.[29]

The combination of strong changes to operations and the weak financial situation of SJ meant that numerous parts of the railroad system had to be shut down. This particularly affected minor operations and local parts of the system, but also brought a stronger focus on large scale standardisation in the freight-related aspects of railway operations. Local handling of freight in shunting yards were gradually transferred to larger terminals with shunting yards, and similar trends also affected the maintenance facilities for both the rail-system and trains. The effect was a generation of a large quantity of obsolete assets pertaining to railway operations; former stations, storage facilities and warehouses, maintenance buildings situated near the stations, shunting yards and side rail track-systems successively becoming obsolete.[30]

This restructuring of the operations was occurring alongside a gradually deteriorating maintenance standard of the railway system and its related facilities and assets at large. Railway tracks without traffic, old stations and maintenance houses not in use and tracks adjacent to railway stations in towns left without railway traffic, became over time a well-known sign of the railway system. The earlier, ambitious gardens and related facilities connected to railway stations found itself reduced to smaller flower beds, or indeed a cessation of gardening altogether. An impression of decay spread across the system well into the 1990s.

An example of decay. A storehouse next to other buildings from the railway safeguarded as National Monuments in Landeryd, in the western part of Sweden. Photo: Björn Olofsson, Jamtli 2021.

During the later decades of this period, the late 1980s to 2000, tendencies towards introducing changes to the railway system gradually grew stronger. The deregulation of the railways by the late 1980s, the splitting up of SJ in railway operations and a separate agency for management of the rail-track infrastructure, made it easier for SJ to focus on a development of new railroad transport efforts. The political interest in railroads also switched from perceiving railroads as the "reverse salient" of transportation development, to representing an attractive, efficient and environmentally friendly alternative, especially as concerns over emissions from fossil fuelled transport gradually became vogue. Innovation of rail-tracks, stations and freight transport facilities increased, often related to passenger services, with a focus on regional railroad transportation.

How did this development over five decades affect aspects of cultural heritage? There seems to be few examples of reports and research from the decades where changes to the railway system were accentuated. A report from the Swedish Railway Museum (2017:189) mentions that a huge number of former houses owned by SJ were gradually demolished, often because of advanced decay or due to being outdated from a living standard perspective. A substantial number of houses were transferred to private owners as railways were closed. This took place, however, without much in terms of elaborated description or research related analysis pertaining to these structures as the demolition and transferral processes went about. The first, substantial effort to describe and categorise station buildings and alike, from a cultural heritage perspective,

Mariefred with its station building and trains in use captured in 2020. Photo: Hans Wicklund.

The station building in Falun from the 1870s preserved and extended with a new building serving bus travellers since 2017. Photo: Jan-Åke Bosell 2015. From: www.vireser.se

was carried out by SJ during the 1980s, and in this process the county administrative boards *(Länsstyrelser)* and local municipalities were involved.[31)]

Aside from this general and overarching developmental trend, there has long since existed an interest in preserving railway history on a local level, and often facilitated by voluntary initiatives. Railway societies and associations have been formed to take care of railway systems that have been closed by SJ, and there are numerous such examples in Sweden. One prominent example of these, *Östra Sörmlands Järnväg,* was initiated by the late 1950s[32)] and is preserving a railway dating back to the late 1890s, with a railway station in a small village, Mariefred. From a cultural heritage perspective, these railway associations play a crucial role in the preservation and exemplification of how the railway system could function and appear in earlier periods.

New era 2000-

As previously described, following the first five decades after the Second World War, the railway system and railway transport gradually regained constructive momentum in the political sphere, and in the public debate on transportation issues. Several different influences had their part in this turn-around in perceptions of the railways, from the unmodern "reverse salient" in the transportation system to – once again – becoming a vital part of visions for a society more in line with sustainable development, than other transport modes. The deregulation of the railway system by the late 1980s had an important role in this change, as it led to freer operating conditions for the remaining SJ, which was soon after the turn of the millennium transferred into a state-owned limited company (SJ AB), with a clear ambition to generate profit based on user fees and transport services delivered to public sector authorities, primarily regionally. The freight operations of SJ were separated to form a state-owned company, which was intended to more efficiently be able to meet the strong competition from other freight carriers in the market, which is primarily road transport. The latter has, however, proven to be a very challenging task, with rail freight remaining yet a low-margin operation.

The responsibility for the railway stations and some of the auxiliary systems such as shunting yards, were transferred from SJ to a new state-owned company, *Jernhusen,* which today operates many historic as well as modern railway stations. The Swedish Transport Administration *(Trafikverket),* formed in 2010 as a merger of the former Railroad and Road Administrations, has kept in their possession the land closest to the tracks, while private and public sector actors on local and regional level today own most of the land adjacent to the railways.

The interest in passenger rail transport was also renewed. Competition in the rail market, both for national lines and in the regional and local commuter and metro/tram system (in the latter cases in the form of procurement of operations of tracks and traffic by the regional and local authorities), transformed the previous state monopoly into a market with many players and activity. The stronger role of Regions in Sweden, with a responsibility for regional and local public transportation, from the 2000s onward also contributed to stronger demand for an increase to regional and local public transport in general, and with rail-transport as a preferred option. Among the first was the newly organised Region Skåne in southern Sweden, initiating a new regional train system, *"Pågatågen".* Following this, passenger transport by rail increased strongly over the first two decades of the 2000s. As a side effect, many railway locations and stations that were taken out of use during the earlier time periods again have been put to use, with older railway stations being transformed into connection points for different modes of transport.

Visions for, and completion of, a number of major railroad infrastructure projects has been part of a strengthening interest in railroad transport, both in terms of passenger and freight. The actual new developments of railroads outside the cities following a standstill of almost 75 years has indeed prompted a strong, general interest in railroads. Additions of new rail systems to enhance railroad capacity around the major cities (Stockholm, Malmö, Gothenburg) have been important parts of this development, with the major project *Västlänken,* still ongoing in Gothenburg, the *City tunnel* in Malmö and the *City line* in Stockholm as other examples.

Teckomatorp in Skåne, in the southern parts of Sweden, is one example where to old station building is still connected to the railway and the new trains Pågatågen. Photo: Frederik Tellerup 2016. From: www.jarnvag.net

In addition to this, a new railway north of Stockholm reaching Umeå some 600 km north of Stockholm, has been another important addition to the rail system, with an ongoing extension to Luleå. Planning for high-speed rail (currently though planned for a speed of 250 km/h), connecting Stockholm, Malmö and Gothenburg has been underway since the early 1990s, and a first stretch from Stockholm to Linköping in mid-Sweden is under construction, with more stretches to follow. Additional visions for new construction are discussed and furthered on a local and regional level in several geographies in Sweden, some of these with a border crossing perspective. All these projects of course affect the landscape and the cultural heritage, since they often are constructed close to older railway-sections and structures.

This strong development has led to renovations and fresh construction of railway stations in many places. Completely new railway stations have been planned and built along the new railway lines in different locations, ranging from major projects in the larger cities to more frugal stops in the regional railroad systems. The variety is massive. In many cases, renewed interest in the railway system has led to increased maintenance of railroads and railway stations that have been sparsely looked after in the later decades. The demand for increased capacity and higher quality standards has, though, also led to an interest in complementing the older stations with new additions, or to the new construction of stations in places where station buildings have been present for a long time. This of course can lead to conflicts between different interests in relation to the built environment and the cultural heritage, and it generally is a major question as part of the land-use planning in the municipalities where railway capacity is being expanded.

Freight transport on rail has continued to develop with successively more efficient ways to operate. In general, this has led to a concentration of shunting to larger, but fewer locations in the railroad-system. Older facilities – often being close to cities – have become obsolete and is frequently focused on in terms of a growing interest to construct housing and office space near to the railway stations themselves. Many city landscapes have as result of this process been transformed into denser areas with new town-structures close to the railways. (Over-) decking of railroads is one such type of project, often with high cost, that has been part of city development. Preservation of industrial landscapes has also become an important strand of interest in cultural heritage preservation, particularly in a local context.[33)]

Construction of new railways has led to an uptick in discussions regarding the effect on the landscape this infrastructure inevitably has. How does the landscape change when new major infrastructures are added to earlier greenfield areas? In what way should, and can, the older structures that are today perhaps obsolete, be preserved for present and future generations to be able to understand and capture the layers of development, that stepwise transformed the railway system and characterised economic development at large?

CULTURAL HERITAGE STUDIES RELATED TO THE RAILWAYS ñ A MULTIFACETED APPROACH

The railway system is one of the longest lasting technological systems still in use in society. Over its long lifetime, the railway system has undergone changes of direction and experienced radical innovations with regards to technology, markets, market shares and function. Assets that today represent valuable cultural heritage has been generated since the 1850s and consists of a very large and multifaceted set of facilities, installations, buildings and rail-track. In this way, the railway system in its entirety is one of the most challenging subjects of historical preservation.

In this field, the multifaceted structure and the plethora of approaches that can be the starting point for grappling with, and understanding, the railways' cultural heritage means that there most likely will be a continuous stream of challenges and frustrations to be faced. It is highly unlikely that a consensus view on priorities and aims will be reached, and the available resources for preservation will probably always be too scarce, at least from the perspective of cultural heritage preservation.

When the aspects discussed in this article; the functional and the temporal, are combined, a pattern of generation of cultural heritage assets as well as challenges and possibilities for preservation of assets from different periods, and with different functions becomes visible. This pattern is presented in Table 1 below, and it has guided our structuring of references to literature and research in this article. Used as a working method in this article, the pattern could also possibly be useful in other similar studies.

Following the structure outlined in Table 1, cultural heritage related to the railway system can be classified according to the period in which it was originally constructed, in what way it has been transformed over time, and by how the remaining physical expressions are used or otherwise maintained (or demolished) today. The table also exemplifies how the physical assets of the railway system have different origins and represent different challenges as regards preservation efforts today, both spatially when it comes to the places where the assets are located, and as to whether these assets/facilities are publicly available or only accessible for specific groups internal to the system.

The physical expressions connected to the railway system (general use of land, buildings, station areas etc) have thus been formed in different situations and with very different profiles in terms of remnant physical assets from the different time periods. It is not only that the cultural heritage assets that remain can be interpreted from the present standpoint and with the contextual norms that dominate the discourse today, but the vast historical assemblage of assets also conveys different messages and societal values; each an expression of the time in which they came to be. The reading of the physical expressions of the cultural heritage of the railway system, therefore, has to be multifaceted and multidisciplinary, which of course renders the endeavour quite challenging.

One such aspect is that assets in use that become cultural heritage, with a positive value as seen from the perspective of one period, can be treated as obstacles or problematic in a later period. For example, extant old station buildings can be seen as hampering the continued development and attractivity of the system, not least in cities where change and reconstruction is continuously ongoing. Physical expressions of the railway system such as workshops and maintenance buildings can on the other hand take on more positive connotations over time: A locomotive maintenance hall, previously seen as something expressing a dirty and noisy workplace can gradually be seen as an attractive and innovative setting for a museum, modern workspaces/workshops or a market hall.

Even if there are large unresearched areas and investigations still to be carried out with regards to the railway systems' cultural heritage, some broader attempts to fill out the gaps have been made during recent years. As an example, inventories have recently been conducted along certain lines by the Swedish Transport Administration, but at the same time there is no national overview of the cultural environment along the railways in Sweden. There is no analysis of which buildings and technical facilities that have been demolished and how this has affected the historical dimension of places, the railway system and the everyday life of citizens. Furthermore, there is no research discussing the decay of former designer-built environment or the impact of the fractionated ownership in station areas, after Bergkvist 2013 high-

Time period	The rail-track system	Freight	Passenger
Establishment 1850 – 1900	Old railway stretches nowadays still in use, rebuilt, demolished or transferred to railway history associations' ownership.	Some old facilities from this period still in use, but mostly "historic".	Some stations still in use, but often rearranged and reconstructed.
Maintenance 1900 – 1950	Comparatively fewer new stretches were built. Electrification changes the physical appearance of the track-system.	Buses and heavy road freight are combined with railroads in growing extent.	The railway stations are maintained as exemplary public spaces.
Reduction 1950 - 2000	Many stretches were taken out of use. An increase of obsolete assets, but also demolition of old assets.	Facilities in use, but often reduced or demolished.	Many station areas and areas where the staff were living and cultivated the land were abandoned or remade.
New era 2000 -	New railways have been constructed and affect also the cultural heritage.	Strong focus on effectiveness, which is affecting the physical assets and cultural heritage with new-building and demolition.	Old stations are demolished/or used in new ways. The built environment along railways is often in decay.

Table 1. The railway system – functional aspects and different time periods.

lighted the situation in his research field.[34] On the other hand, the designed green areas adjacent primarily to railway stations have been deeply studied from different perspectives, but even so, as an example, the traces of the extensive gardening efforts along railways is not treated as a cultural heritage in terms of legislation or plans of maintenance.[35]

Some years ago, an initiative was also taken by the Swedish Transport Administration with the aim to combine research in three different aspects of landscape connected to rail and road infrastructure – ecology, open-air activities and cultural heritage – and to identify what research that would be important to initiate in relation to the rail infrastructure system. Furthermore, the researchers aimed to identify the main research questions for the future. The publication pointed out the lack of research on maintenance of the cultural heritage, as well as lack of basic inventory methods. Unfortunately, the report was not published outside the Transport Administration and therefore the results are not known in wider circles of academics in the cultural heritage sphere.[36]

The analysis in the publication also made it clear that there are difficulties in accessing information about older assets since general "knowledge storages" are lacking. Knowledge and experiences from projects over time is not stored or available at one place, archive or in one IT system, instead it is spread out across different actors and stored and kept under different circumstances. In the best case scenario, the material is searchable in public archives.

These latter deficiencies have recently been addressed by a research-project financed by the Swedish Transport Administration. A research project named "Historical data for the benefit of infrastructure and research – a feasibility study" *("Historiska underlag till nytta för infrastruktur och forskning - en förstudie")* that was finalised in 2024 had the purpose to "investigate how the historical materials can be used in current work within the Swedish Transport Administration and in research related to infrastructure. The aim of the project was also to make the historical collections concerning roads, aviation and railways useful in the Swedish Transport Administration's operations and in research by applying new methods.[37] The project has arranged several workshops, pilot studies in archives, and a broad literature overview in railway history, including research from both academics and practitioners.[38] The project, organised as a pre-study, also points to future research projects that can be carried out.

RESEARCH GAPS

Our view is that further research related to the railway system is necessary to better understand and interpret the system's development, future opportunities and its challenges, as seen from a cultural heritage point of view. When reviewing the numerous studies carried out over time in relation to railroads, a general reflection is that the majority of these have either been performed by laymen or at least not in the form of proper research with a theoretical footing. It is a common theme that most of these studies, reports and documentary efforts are focused on specific parts of the system, rather than aiming at a broader, lateral perspective on the railway-system and its development.

A reason for this piecemeal rather than overarching perspective in research is probably that the initiative for change in the railway system, that often motivates studies of the cultural heritage, and the need for preservation and protection of railway related assets, often comes from local urban development processes and projects, rather than from actors with a system perspective. Even though there are examples of how wide-ranging projects also affects the railway-system. From a structural point of view, change and challenge to the historical railway system thus might come from three sources:

The Swedish Railway Museum rebuilt with new exhibitions reopened in 2024, is housed in a former locomotive station. From: The Swedish Railway Museum and Tyréns.

- Local city and urban planning – in general initiated by municipalities or landowners.
- The general process of increasing efficiency and reducing costs in the railway system.
- Major railway projects where existing structures in the system are exchanged for new structures - often initiated by the Swedish Transport Administration.

We would argue that this leads to a situation in which cultural heritage aspects are most commonly analysed properly only in parts, e.g., for a railway station and not for railway stations in general, or for older maintenance building in a specific place, rather than for maintenance buildings related to the railway in general. The development of methods to analyse the landscape of transports by researchers predominantly has its inception in new major projects for roads, involving taking the perspective of landscape architecture.[39] Research projects investigating and developing analysis-methodologies focusing on the historical built environment along the railways are almost completely absent.

The longevity of the system calls for a longitudinal approach to railway systems research, as we have mentioned earlier. The successive developmental steps of the system, and the understanding of the remaining physical expressions is, in our view, captured well by taking such a perspective as its starting point. Studies incorporating the prerequisites and challenges common to the development of large technological systems are therefore also good starting points for further research, one where technology, economy and politics are part of the analytical paradigm. In addition, we require more additional insights into climate change how such changes will affect our cultural heritage.

Based on the view presented above, there is a need for – and room to do – further research on the cultural heritage of the railway system; research that from its inception incorporates general aspects of the railway system's development and its expressions. These studies can be carried out within many different research fields and with different approaches, both more directed to preservation and to more general understanding of the cultural heritage. Some of these studies could be exemplified by the following suggestions:

- Longitudinal studies – studying the meaning and function of railway landscapes and buildings over time, including precursors to the main lines.
- Horizontal studies of the cultural heritage aspects of the railway as a system, on a national and overarching level.
- The impact of the railway architecture locally, regionally and nationally.
- The use/appropriation of the railway systems and technology for varying ideological and political purposes over time.
- How the rationalization/efficiency concept has affected the cultural heritage. The interface and conflicts between natural values, cultural values, design and technical development.
- The cultural heritage contributions or problems connected to climate change, circularity and the sustainability agendas.
- The gardening along the railways has been studied in several studies, but how can the traces of the gardening be treated as a cultural heritage to take care of?
- Studies regarding how to relate to cultural values in a technological system that is constantly changing.

Investigating a complex technical system like the railways in its continuous physical reshaping is undoubtedly a demanding undertaking, but it is an absolutely necessary endeavour in the pursuit to understand different aspects of Sweden's cultural heritage and how to take good care of it.

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