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Integrating Social Sustainability in Double-Track Railway Expansion

A Closer Look at Decision-Making and Stakeholder Dynamics, in a Swedish Context

Master's thesis in Design Construction Project Management

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ABSTRACT

The expansion of railway infrastructure is a central component of sustainable mobility strategies, yet the integration of social sustainability into such projects remains underdeveloped in Sweden. Despite the potential for railway investments to foster accessibility, inclusion, and quality of life, these aspects are often overshadowed by economic and environmental priorities. This study aims to investigate how decision-making processes and stakeholder dynamics influence the integration of social sustainability in double-track railway expansion projects between large and medium sized cities in Sweden. Anchored in Social Impact Assessment (SIA), stakeholder theory, and Arnstein's Ladder of Participation, this research examines two case studies: the Gothenburg-Trollhättan and Ängelholm-Maria projects. Data were collected through document analysis and semi-structured interviews with key stakeholders, including transport agencies, contractors, and consultants. The findings reveal that while social impacts such as accessibility and daily life improvements are recognized, their prioritization is often reactive and lacks coherence, largely dependent on individual actors, champions, rather than systematic frameworks. Decision-making processes tend to emphasize economic feasibility, with consultation processes frequently limited to informing or consultation levels on Arnstein's ladder, thus marginalizing deeper forms of citizen influence. The study concludes that the absence of formalized SIA frameworks in Sweden hinders the proactive integration of social sustainability in railway infrastructure projects. It recommends the development of standardized SIA guidelines to strengthen social outcomes in future projects.

Key Words: Social Sustainability; Railway Infrastructure; Decision-Making Processes; Stakeholder Dynamics; Social Impact Assessment; SIA; Double-Track Railway; Infrastructure Planning; Arnstein's Ladder of Participation; Stakeholder Theory; Participation; Consultation; Sweden; Governance; Power Dynamics; Sustainable Transport.

Integrering av Social Hållbarhet i Utbyggnad av Dubbelspårig Järnväg
En Närmare Titt på Beslutsfattande och Intressentdynamik, inom en Svensk Kontext

Examensarbete inom masterprogrammet Organisering och ledning i bygg- och fastighetssektorn

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SAMMANFATTNING

Utbyggnaden av järnvägsinfrastruktur är en central del i strävan mot ett mer hållbart transportsystem. Trots detta är integreringen av social hållbarhet i sådana projekt fortfarande begränsad i Sverige. Även om järnvägsinvesteringar har potential att stärka tillgänglighet, inkludering och livskvalitet hamnar dessa aspekter ofta i skymundan för ekonomiska och miljömässiga mål. Syftet med denna studie är att undersöka hur beslutsprocesser och aktördynamik påverkar integreringen av social hållbarhet i dubbelspårsutbyggnadsprojekt mellan större och medelstora städer i Sverige. Med utgångspunkt i Social Impact Assessment (SIA), intressentteori och Arnsteins deltagandestege analyseras två fallstudier: Göteborg–Trollhättan och Ängelholm–Maria. Studien bygger på dokumentanalys samt semistrukturerade intervjuer med centrala intressenter, däribland transportmyndigheter, entreprenörer och konsulter. Resultaten visar att sociala effekter, såsom förbättrad tillgänglighet och vardagsliv, visserligen uppmärksammas, men att prioriteringen av dessa frågor ofta är reaktiv och saknar enhetlighet. Den drivs i stor utsträckning av enskilda individer och eldsjälar snarare än av etablerade systematiska ramverk. Vidare tenderar beslutsprocesserna att fokusera på ekonomisk genomförbarhet, medan samrådsprocesserna ofta begränsas till informations- eller samrådsnivå enligt Arnsteins stege, vilket innebär ett begränsat medborgarinflytande. Studien drar slutsatsen att avsaknaden av formaliserade SIA-ramverk i Sverige försvårar en proaktiv och integrerad hantering av social hållbarhet i järnvägsinfrastrukturprojekt. Det rekommenderas att standardiserade SIA-riktlinjer utvecklas för att stärka de sociala effekterna i framtida projekt.

Nyckelord: Social Hållbarhet; Järnvägsinfrastruktur; Beslutsprocesser; Aktördynamik; Social Impact Assessment; SIA; Dubbelspår; Infrastrukturplanering; Arnsteins deltagandestege; Intressentteori; Deltagande; Samråd; Sverige; Styrning; Maktförhållanden; Hållbara transporter.

Contents

Preface

This thesis is the result of a rewarding and challenging journey, where our ambition has been to explore how railway infrastructure projects in Sweden can be better aligned with the principles of social sustainability. Throughout the process, we have been given the opportunity to engage with inspiring professionals, dedicated researchers, and committed stakeholders who have generously shared their experiences, insights, and time.

We would like to express our sincere gratitude to Crabat for their invaluable support throughout this research process. In particular, we extend our heartfelt thanks to Magnus Repsgård for his encouragement, insightful guidance, and continuous support. His efforts in helping us identify relevant case studies, providing motivation for our research focus, and connecting us with key interviewees have been instrumental in shaping this work. Furthermore, we deeply appreciate the time and space he has given us to explore our ideas, allowing this study to develop in a meaningful way.

We are also incredibly grateful to our supervisor at Chalmers, Janneke van der Leer, for her unwavering support, kindness, and invaluable guidance. Her thoughtful feedback, encouragement, and enthusiasm for our work have been truly inspiring. She has not only helped us refine our ideas but has also continuously motivated us to push our research further. This thesis would not have been the same without her insight and dedication, and we deeply appreciate all the time and effort she has invested in our work.

Thank you for your generosity and commitment to fostering research in this field.

We hope this thesis contributes to a deeper understanding of how social sustainability can be more systematically integrated into decision-making processes in railway infrastructure development, and that it sparks further discussions and improvements in the field.

Göteborg May 2025

LEVI CERVANTES

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Abbreviation list

CBA	Cost Benefit Analysis
CRC	Convention on the Rights of the Child
EIA	Environmental Impact Assessment
SALAR, SKR	Swedish Association of Local Authorities and Regions
SEB	Comprehensive Impact Assessment
SFS	Swedish Code of Statutes – the official and authentic version of laws, ordinances and certain government regulations.
SIA	Social Impact Assessment
SJ	Swedish State Railways

1. Introduction

1.1. Background

Sweden's railway system has a long history, dating back to 1856 with the opening of its first track (Trafikverket, 2024a). Although the country began developing its railway infrastructure later than many of Europe's great powers, its rapid expansion led Sweden to lead in railroad mileage per capita by 1874, a position it still holds today. The network peaked in 1905 at 12,647 kilometers but has since declined in extent (Trafikverket, 2024a). The railways played a vital role in shaping national mobility, linking rural areas to urban centers and enabling Swedes to move beyond their local surroundings. Despite this historical legacy, the expansion of railway facilities stagnated during much of the 20th century. While demand has surged, surpassing 250 million annual journeys in 2019, the infrastructure has largely been maintained rather than expanded (Trafikverket, 2024a). Today, the system faces challenges such as aging tracks, overcrowding, and the need for modernization (Åhrén & Parida, 2009). The current national traffic plan emphasizes not only repair but also significant investments in renewal and expansion of the railway network (Trafikverket, 2024a).

Railway infrastructure development is a cornerstone of sustainable transportation, supporting both freight and passenger mobility while reducing environmental impact (Cervero, 2020). In Sweden, the railway system is central to national and regional connectivity and economic development (Trafikverket, 2024a). As sustainable development gains prominence, especially in the context of Agenda 2030, there is increasing recognition of the need to balance economic, environmental, and social priorities in infrastructure planning (World Bank, 2023).

Social sustainability in railway projects concerns the fair distribution of benefits and the mitigation of negative impacts, particularly for vulnerable groups (Vanclay, 2002). This includes affordable and reliable transport, fair compensation for those affected by construction, and inclusive planning processes (Bramley & Power, 2010). Efficient railway systems can promote regional cohesion and improve quality of life, but these social benefits require a long-term perspective rather than a narrow focus on economic returns. Agenda 2030, adopted by UN member states in 2015, outlines 17 goals aimed at reducing inequality, eradicating poverty, and fostering inclusive societies (Swedish United Nations Association, 2021). It underscores the interdependence of social, economic, and environmental dimensions. Social sustainability, rooted in the Brundtland Report, highlights principles of justice, equality, and the fulfillment of basic human needs (World Commission on Environment and Development, 1987).

Despite Sweden's strong social policy reputation, social sustainability has not been systematically integrated into transport infrastructure planning. Antonson and Levin (2020) argue that Sweden lacks a structured framework for assessing social impacts within Environmental Impact Assessments (EIAs), unlike many other EU countries. Their study of 18 major transport projects found that social concerns were typically limited to health and accessibility, with little attention to equity, cohesion, or quality of life. Internationally, Social Impact Assessment (SIA) has become a more established practice. Countries like Australia, New Zealand, South Africa, and several U.S. states have introduced mandatory SIA frameworks, shifting it from an optional add-on to a core component of project planning (Antonson & Levin, 2020). In Sweden, however, there are still no binding national guidelines or legal requirements for SIA. This lack of unified direction has led to fragmented approaches at the regional and municipal levels. While some authorities and consultants have developed their own tools, the absence of shared standards results in inconsistencies in both the depth and scope of social impact evaluations.

Adding to the complexity is the involvement of multiple stakeholders, national agencies, regional planners, consultants, and local communities, each with differing priorities and levels of influence (Salet et al., 2012). This fragmented landscape further complicates the integration of social sustainability into planning and decision-making. Although awareness of social sustainability is growing, it remains overshadowed by economic and environmental goals in Swedish railway infrastructure projects (Antonson & Levin, 2020). This often leads to an uneven distribution of benefits and risks among different societal groups, and to social aspects being either overlooked or inadequately addressed. In light of these challenges, it is important to examine how decision-making processes can better support social sustainability. While railway investments have the potential to improve accessibility, inclusion, and quality of life, that potential is often constrained by the lack of clear frameworks and the dominance of economic feasibility in planning decisions.

1.2. Aim

This thesis aims to investigate the social sustainability of constructing double tracks between large and medium-sized cities in Sweden with a particular focus on decision-making processes and the power dynamics between stakeholders. Using Social Impact Assessment as a theoretical framework, and incorporating insights from stakeholder and participant theory, this thesis explores how strategic decisions affect social impact categories and their prioritization. The research examines two case studies, the Gothenburg-Trollhättan and Ängelholm-Maria railway projects, to assess their contribution to social impact categories and the integration of social impact assessments in planning and implementation. It also evaluates the extent to which social sustainability is currently incorporated into railway development investment projects.

1.3. Research Questions

To achieve the aim of the study, three questions have been formulated to determine the research:

RQ1: *How does the construction of double tracks influence social sustainability, as assessed through defined impact categories such as demographic changes, access to social services, lifestyle and daily life, environmental related social effects, safety and crime, political influence and participation?*

RQ2: *What role do policymakers, transport agencies, contractors, and communities play in shaping decisions regarding social impact in railway development?*

RQ3: *How do approaches to decision-making regarding social impacts in the railway infrastructure industry range from reactive to proactive, and what factors influence this tendency?*

1.4. Limitations

The study will be conducted within a Swedish context, with a specific focus on the southern-western part of Sweden. This region has an average population density compared to Sweden at large and similar circumstances across its areas, which will facilitate comparisons and reduce the margin of error associated with contextual differences.

Furthermore, the study will focus exclusively on passenger traffic, excluding freight transport considerations from the analysis and project selection. This decision is because the social sustainability impacts being analyzed are more directly linked to passenger mobility, accessibility, and equity. While freight transport has an impact on sustainability, it will be outside the scope of this study.

It is also important to note that this study will not include surveys or other forms of macro-perspective data collection, such as large-scale public impact assessments. Instead, the analysis will rely on existing project data, secondary sources, and interviews with key stakeholders, focusing on detailed, project-specific impacts rather than broader population-level data.

2. Literature Review

The purpose of this literature review is to provide a comprehensive understanding of how decision-making processes, stakeholder dynamics, and social sustainability interact in the development of railway infrastructure in Sweden. It explores the relationship between sustainable urban planning, infrastructure investment, and the integration of social values into large-scale transport projects. The review outlines key theories, concepts, and empirical findings related to socially sustainable infrastructure. It also addresses how the Swedish planning frameworks, legal regulations, and stakeholder influence shape outcomes in infrastructure development.

Section 2.1 introduces the concept of social sustainability in an urban context, establishing a foundation for how it is understood and applied within infrastructure planning. Section 2.2 moves into the field of infrastructure decision-making, with a focus on stakeholder engagement, participation, and the dynamics of influence throughout the planning process. Section 2.3 turns to the topic of railway infrastructure expansion, examining various approaches to development and the trade-offs they involve. Section 2.4 situates these themes within the Swedish context, presenting the historic and current state of the railway system alongside the national planning framework and the legal and institutional structures that guide decision-making in railway projects. Finally, section 2.5 presents the decision-making basis in infrastructure development within the Swedish framework.

2.1. Social Sustainability in an Urban Context

As global momentum builds around more sustainable and equitable transportation systems, particularly through the commitments outlined in Agenda 2030, there is growing pressure for infrastructure development to address all three pillars of sustainability: economic, environmental, and social (World Bank, 2023). Social sustainability, in this context, refers to society's ability to foster inclusive, equitable, and just living conditions. As outlined in the Brundtland Report, this involves principles such as equality, justice, and the fulfillment of basic needs like housing, food, and employment (World Commission on Environment and Development, 1987).

Social sustainability in an urban context focuses on strategies and initiatives that promote the creation of sustainable and inclusive cities (Bramley & Power, 2010). Bramley and Power (2010) state that sustainability in society is largely about creating an environment where residents thrive and want to continue living over time and to achieve this, a combination of social, economic, and physical factors is required, as well as an interaction between the three of them. According to Bramley and Power (2010), important social aspects of a sustainable city include social cohesion, which fosters a sense of community and belonging, as well as inclusion and equality, ensuring all

groups have equal access to resources and services while reducing socioeconomic disparities. Participation and democracy are also essential, giving residents a voice in decisions that shape their living environment, this approach can be exemplified through citizen dialogues in urban planning. (Bramley & Power, 2010). On the economic side, sustainable cities should create job opportunities that offer fair and stable employment, while supporting local businesses to strengthen the economy, generate jobs, and preserve the unique character of an area, thus reducing dependence on external actors (Bramley & Power, 2010). To prevent economic exclusion, it is important to provide education and skills training for vulnerable groups.

Physical infrastructure is likewise a crucial foundation for sustainability, including residential areas that accommodate various needs and income levels. It is also vital that transport infrastructure, green spaces, and other public services remain accessible to all residents (Bramley & Power, 2010). Within railway development specifically, social sustainability is concerned with distributing benefits equitably across social groups and minimizing negative impacts on vulnerable communities (Vanclay, 2002). This includes ensuring affordable and reliable transport, providing fair compensation for those affected by construction or land-use changes, and enabling meaningful community participation in the planning process (Bramley & Power, 2010). Bramley and Power (2010) emphasize that decision-making plays a crucial role in shaping urban environments that support social sustainability. They argue that traditional urban planning has often prioritized economic efficiency over social considerations. By balancing economic, physical, and social factors in urban development, decision-making can contribute to more inclusive and resilient communities.

2.2. Decision-Making in Infrastructure Projects

Decision-making in large infrastructure projects is a dynamic process shaped by complexity, uncertainty, and a diverse network of stakeholders. Salet et al. (2012) emphasize that this complexity stems from three core factors: the multiplicity of interests and goals, evolving political and social contexts, and interdependencies between systems. These projects often begin with clear, technical goals, such as improving transportation capacity, but gradually expand to include broader social, environmental, and economic dimensions (Salet et al., 2012). As the scope of the project evolves, the stakeholders involved also change, bringing with them new values, priorities, and potential conflicts. At the same time, these projects often span decades, meaning that political priorities and societal values can change during the process (Salet et al., 2012). A government that has approved a project may be replaced by another with different preferences, leading to new demands and reprioritizations. Moreover, large infrastructure projects influence, and are influenced by, other infrastructure projects, regional development plans, and economic trends, creating interdependencies

that often require adjustments to initial plans and contribute to uncertainty regarding project implementation and outcomes (Salet et al., 2012).

To manage the complexity of large infrastructure projects, Salet et al. (2012) argue that institutional change is necessary, as traditional hierarchical and sector-based decision-making structures tend to be too rigid and ineffective. According to Salet et al. (2012), decision-making should incorporate principles of network governance and cross-sectoral collaboration to avoid what they refer to as "tunnel vision", where only one aspect is given priority at the expense of others. This argument is reinforced by Rangarajan et al. (2013), who highlights the value of structured participation and inclusive processes, identifying a wide spectrum of stakeholders that influence and are influenced by rail infrastructure development. These include internal public sector actors (*Trafikverket*), elected officials and labor unions (*e.g., municipal politicians, the government*), rail operators (*e.g., SJ, VR*), local governments and regional planning bodies, business and economic organizations, media outlets, the general public, and civil society groups.

Rangarajan et al. (2013) show that engaging these actors through tools like surveys, public forums, and online platforms not only improves legitimacy but also surfaces regionally specific concerns and aspirations. This reinforces Salet et al.'s (2012) argument for iterative, responsive decision-making frameworks that incorporate feedback and allow for mid-course adjustments. Beyond institutional structure and engagement processes, Cantarelli and Flyvbjerg (2012) stress the importance of addressing systemic distortions such as optimism bias and strategic misrepresentation. These tendencies, where actors overstate benefits and understate costs to secure approval, can derail projects even when participation is broad. They argue that contractual clarity, rather than ownership structure alone, plays a key role in promoting accountability and effective decisions. Together, these perspectives highlight how both institutional design and incentive systems are crucial to improving decision quality in complex infrastructure settings.

According to Moulton et al. (2006), competence can have a significant impact on decision-making at both the organizational and individual levels. They explain that organizational competencies create a shared culture and guidance for decision-making in alignment with the organization's vision and values. At the individual level, Moulton et al. (2006) distinguish between technical competencies and performance competencies, where technical competencies ensure that individuals have the necessary knowledge to make well informed decisions within their area of expertise, while performance competencies, such as problem solving and analytical skills enable effective decision-making. They further argue that in the absence of clear organizational competencies and guidelines, individuals tend to rely on personal experience and judgment, which can result in inconsistent decision-making. Moulton

et al. (2006) states that a strong organizational competency framework can ensure that decision-making becomes more consistent and aligned with the organization's strategy. Additionally, they highlight that individual competence that is not institutionalized may be lost when employees leave or change positions, which can affect the organization's long term decision-making ability and stability.

Taken together, these perspectives underscore that decision-making in infrastructure projects is not a purely technical exercise. It is a social, political, and institutional process shaped by evolving coalitions of stakeholders, organizational structures, and contextual pressures. Addressing complexity requires more than analytical tools; it demands inclusive governance, adaptive learning, and sustained investment in both institutional capacity and human competence.

2.3. Railway Infrastructure Expansion

The expansion of railway infrastructure plays a central role in shaping the development of cities and regions (Cervero, 2020). According to Cervero (2020), railways influence not only travel patterns and accessibility but also the physical structure of urban areas by affecting land use, property values, and the location of economic activity. Cervero (2020) also argues that railway investments have the potential to produce strong transformative effects on cities, especially when combined with conscious and long term planning. However, these effects are not universally positive. Song (2011) notes that poor integration between railway infrastructure and urban planning can lead to inefficient land use and underutilized areas around transit stations. Furthermore, railway expansion has in some cases contributed to uneven urban growth, resulting in increased congestion and spatial imbalances (Keypour et al., 2017). Taken together, these studies illustrate that railway expansion is not only a matter of transportation, but also a strategic tool, and a challenge, in achieving sustainable urban development. The following two sections explore key strategies in railway infrastructure development, new tracks and double-track extensions. Both approaches aim to improve capacity, efficiency, and connectivity, while also influencing broader urban and regional dynamics. The sections highlight both the potential benefits and the challenges these strategies pose for sustainable development.

2.3.1. New Tracks

New railway tracks enhance transport efficiency by increasing capacity, improving traffic flow, and enabling faster, more sustainable connections (Profillidis, 2016). According to Profillidis (2016), modern railway tracks use advanced materials and engineering techniques, enabling higher speeds, improved rail performance, and shorter travel times. Profillidis (2016) also highlights that building new railway lines improves efficiency and network organization, enabling it to handle more traffic and reduce congestion on already overburdened routes. When trains can operate without

interference from other lines, Profillidis (2016) noted that it reduces the need for diversions and traffic disruptions, in turn improving capacity and punctuality. Additionally, Profillidis (2016) emphasizes that new tracks create connections between previously underserved regions and cities, stimulating economic development and fostering new business opportunities.

According to Song (2011), railway infrastructure development of new tracks faces several significant challenges, including financing difficulties, governance issues, and inefficient management. They further argue that many large scale new development railway projects suffer from cost overruns and delays due to poor planning and misallocation of resources, which Bourguignon and Pleskovic (2005) echo. Bourguignon and Pleskovic (2005) state that corruption and weak regulatory frameworks hinder the effectiveness of railway investments, leading to suboptimal outcomes.

2.3.2. Double Track Extension

Upgrading a railway line from single to double track involves adding a second track parallel to the existing one, allowing trains to travel in both directions without having to wait at passing sidings (Sogin et al., 2013). According to Sogin et al. (2013), this type of expansion is commonly used to increase capacity on heavily trafficked corridors where both freight and passenger trains share the same infrastructure. Double-tracking is a substantial investment, particularly in areas with complex conditions such as densely built urban environments, mountain passes, or environmentally sensitive zones (Sogin et al., 2013). According to Sogin et al. (2013) double tracking brings several benefits, most notably reduced delays and a steady, predictable increase in capacity. The ability to facilitate smoother train meets and overtakes enables slow freight trains and faster passenger trains to operate more efficiently on the same line. This effect is especially noticeable at higher traffic volumes, where each additional kilometer of double track provides increasing value.

Double tracking can also serve as a tool for creating more equitable and inclusive travel opportunities by enabling more reliable and frequent passenger services, an essential aspect of developing a socially sustainable transport system (Sogin et al., 2013). At the same time, Sogin et al. (2013) highlight the nuances of double track expansions where capacity losses often occur in corridors where fast passenger trains and slower freight trains share tracks, mainly due to differences in speed and train priority. In such cases, the expansion does not necessarily result in improved service for freight traffic, but rather aims to maintain current service levels despite increasing competition for available capacity.

2.4. Swedish Context

This chapter provides an overview of the historic and current condition of the Swedish railway system, including its key challenges related to capacity and punctuality. It then outlines the legal frameworks, planning processes, and stakeholder roles that shape railway project development in Sweden. The chapter concludes by introducing the classification of municipalities as an analytical tool to better understand how city size influences project conditions and strategic infrastructure decisions.

2.4.1. The Evolution and Current Challenges

The development of the Swedish railway system over the past decades has been characterized by a profound institutional transformation. Until the late 1980s, the Swedish State Railways (SJ) operated as a monopolistic entity responsible for both operations and infrastructure (Alexandersson & Hultén, 2008). With the 1988 transport policy reform, a deregulation and restructuring process was initiated, in which railway infrastructure was separated from train operations and the responsibility was transferred to the newly established authority Banverket, now known as Trafikverket. This reform enabled railway investments to be managed independently of operational activities, which in turn led to a significant increase in public investment capacity during the 1990s and 2000s. Government investment in railway infrastructure rose sharply, from approximately one billion SEK to around ten billion SEK annually in the early 2000s. The aim of these investments was to improve both capacity and safety, leading to new railway lines and upgrades for higher speeds and increased capacity. However, Alexandersson and Hultén (2008) note that these investments were not always guided by actual transportation needs, as regional political considerations were often prioritized. As a result, capacity expansion has at times occurred in areas where pressure on the network was not the greatest. Alexandersson and Hultén (2008) therefore confirm that the capacity of the railway network is a central challenge in today's Swedish railway system, particularly along the most heavily trafficked routes.

This issue is further underscored by Åhrén and Parida (2009), who describe the condition of the Swedish railway infrastructure as strained, largely due to a sustained increase in traffic volumes over recent decades. The intensified use of tracks and other infrastructure has contributed to a decline in punctuality, defined as the ability of trains to adhere to scheduled timetables. Åhrén and Parida argue that punctuality serves as a key indicator of system efficiency; high punctuality suggests that the infrastructure is operating effectively, whereas consistent delays often reveal capacity bottlenecks or systemic weaknesses. Thus, while investment levels have increased significantly, the growing mismatch between infrastructure capacity and operational demands continues to limit the overall performance and reliability of the Swedish railway system (Åhrén & Parida, 2009).

2.4.2. Law on the Construction of Railways

The Swedish law on the construction of railways regulates the planning, construction and land acquisitions for railway projects in Sweden (SFS 1995:1649). The law defines railways as a track facility for railway traffic, including tracks, safety devices and traffic management systems. SFS 1995:1649 regulates that when new construction or significant renovations are made, a railway plan is mandatory, and it needs to include maps, environmental impact assessment and consultation with affected parties such as municipalities, county board and property owners. Further, Trafikverket is responsible to try and determine new railway plans, but if major disagreements occur with the county board the question at hand can be handed over to be handled by the government.

The law also allows for temporary claims of land to research and prepare for construction, however the property owner has the right to just economic compensation for damages and limitations in land use. If a railway plan entails that a property needs to be claimed, they can be settled either through voluntary agreements or through expropriation (SFS 1995:1649). In accordance with the law, the property owner can also demand payment if their property is significantly impacted by the railway construction. Decisions regarding railway plans can be appealed against to the government, while other decisions are tested by the general administrative court. By balancing societal interests, individual rights and environmental concerns, the law aims to ensure sustainable and efficient development of the railway infrastructure in Sweden.

2.4.3. Planning Process and Detailed Development Plan

Before project-specific planning begins, long-term transport system planning occurs at national and regional levels, a national transport plan defining government priorities and budget allocations for infrastructure projects is created by Trafikverket and regional transport plans, managed by counties to address regional transport needs, including road improvements and public transport support are also formulated (Trafikverket, 2017). The Swedish government ultimately approves the national transport plan based on Trafikverket's recommendations. According to Trafikverket (2017), the development of railway and road infrastructure in Sweden follows a structured process governed by Trafikverket, ensuring that investments are planned, assessed, and implemented in a systematic manner. This process consists of three main stages: action choice study, planning phase and decision phase, see figure 1.

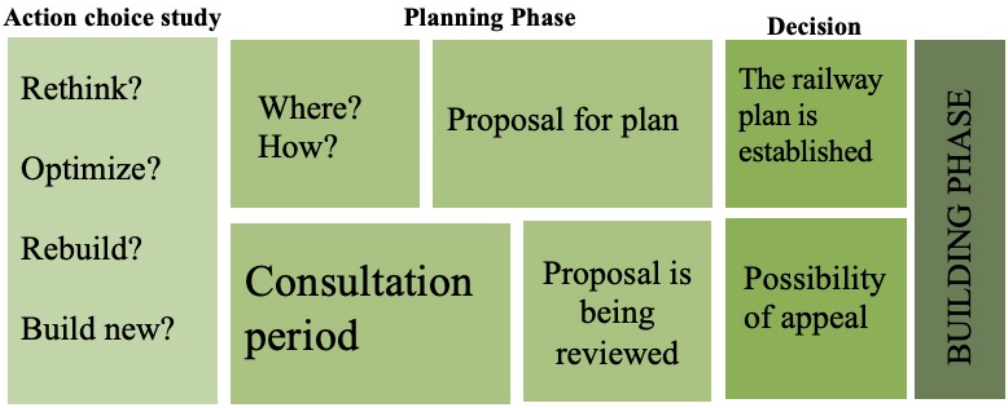

Figure 1. Overview of the Swedish railway planning process.

The first step in Trafikverket's process is the action choice study, which aims to identify deficiencies in the transport system and evaluate potential solutions, this stage is done by the planning department at Trafikverket. This stage is guided by a four-step principle, a framework designed to determine the most effective approach (Trafikverket, 2017). The study prioritizes solutions from the first two steps before considering reconstruction or new infrastructure. It also provides justification for why a project is needed. The four steps are:

1. Rethink: Can the need for transport be reduced or shifted to other transport modes (e.g., from roads to rail)?
2. Optimize: Can existing infrastructure be used more efficiently (e.g., speed adjustments, traffic regulation)?
3. Rebuild: Are minor modifications, such as platform extensions or curve straightening, sufficient?
4. Build new: If necessary, should a completely new road or railway be constructed?

Once a need for infrastructure development has been identified and initial assessments have been made, the project enters the planning phase. This stage involves detailed investigations into where and how the infrastructure should be built, including the preparation of construction documentation. The aim is to ensure that development is carried out efficiently while balancing sustainability, economic feasibility, and meaningful public engagement. This stage is handled by the investment departments at Trafikverket. It follows a legally governed planning process (planläggningsprocess) and results in either a road plan (vägplan) or railway plan (järnvägsplan). This main components of this phase include (Trafikverket, 2017):

Feasibility studies to assess different alternatives.

- Environmental impact assessment (EIA) to evaluate potential environmental consequences and propose mitigation measures.
- Stakeholder consultation, including municipalities, organizations, and the public, to gather input.

After a public review, adjustments may be made before the plan is finalized (Trafikverket, 2017). Once approved, there is an appeal period before it becomes legally binding, allowing construction to proceed. Once the plan is legally approved, detailed technical specifications and construction guidelines are developed (Trafikverket, 2017). These include:

- Functional and safety requirements for the road or railway.
- Environmental protection and risk mitigation measures.
- Adherence to the approved plan, with only minor deviations allowed.

If significant changes are needed, a new or revised plan must be created (Trafikverket, 2017).

According to Trafikverket (2017), stakeholders, including local residents and organizations, have opportunities to provide feedback throughout the process. They emphasize that early participation increases the likelihood of influencing decisions.

2.4.4. Public Procurement Act

Once a plan has been established, the project moves on to the next major phase, procurement. The Public Procurement Act (2016:1145) regulates purchases made by public organizations such as government authorities, municipalities, and regions, including Trafikverket (Upphandlingsmyndigheten, n.d.-c.). These entities must follow specific regulations to ensure market competition and the efficient use of public funds. According to upphandlingsmyndigheten (n.d.-c.) public procurement exists to serve several important societal interests by promoting cost effective use of taxpayer's money, ensuring free movement within the EU, preventing anti competitive behavior, and making it easier for companies to do business with the public sector.

A procurement process begins when the contracting organization identifies a need that must be analyzed and defined to establish the conditions for the purchase (Upphandlingsmyndigheten, n.d.-a). The description of the need, along with financial calculations and market and risk analyses, forms the basis for drafting the procurement documents. Once the procurement documents are completed, the contracting authority must publish the procurement in an announcement database, and interested suppliers

respond to the notice by submitting a bid (Upphandlingsmyndigheten, n.d.-b). In their bid, the supplier must describe how they meet the requirements, after which the contracting authority evaluates the submitted bids. The supplier that submits the most economically advantageous bid, based on the evaluation criteria set by the contracting authority in the procurement documents, is awarded the contract, the evaluation criteria include the best price-quality ratio, cost, and price (Upphandlingsmyndigheten, n.d.-b).

2.4.5. Contract Types of Infrastructure Projects

The contract type is determined by the client, for railway infrastructure projects it is often Trafikverket, during the preparation of the request for proposal, influencing how responsibilities within the project are allocated between the client and the contractor (Boverket, 2024b). In Sweden, the terms *totalentreprenad*, which can be translated as Design & Build Contract, and *utförandeentreprenad*, corresponding to Construction Contract, are commonly used. According to Boverket (2024b), these definitions are similar to Design-Bid-Build and Design-Build but with slight nuances and are the most common contract types for infrastructure projects. In a Design & Build Contract, the client enters into an agreement with a single contractor responsible for both design and execution (Svensk Byggtjänst & Byggandets Kontraktskommitté, 2006). In the procurement documents, the client specifies functional requirements that describe the project's usability or characteristics, and the contractor assumes full responsibility for ensuring the project meets the agreed functionality. In Construction Contracts, the client is responsible for the design, while contractors, who have a direct contractual relationship with the client, are responsible for execution (Svensk Byggtjänst & Byggandets Kontraktskommitté, 2004). This means that the client is accountable for ensuring that the final design of the project is suited for its intended function.

According to Eriksson et al. (2017) railway projects are usually procured through the traditional Design-Bid-Build system, where the client, usually Trafikverket, determines the design, and the contractor is responsible for construction. However, Eriksson et al. (2017) highlight that in recent years, the Design-Build system has gained traction as Sweden has moved towards more collaborative models. Design-Build gives the contractor more freedom and responsibility for both design and construction. In order to improve efficiency and innovation in larger and more complex projects, Trafikverket has implemented a change process where more responsibility for design and construction is given to the contractor (Eriksson, Lingegård, Borg & Nyström, 2017). The report *Development of Functional Requirements for Turnkey Contracts* from Trafikverket, by Bröchner and Silfverbrand (2017), describes how functional requirements can improve the conditions for contractors to develop cost effective and sustainable solutions, which also strengthens the contractor's responsibility for both the project's design and execution. Furthermore, Trafikverket states, in their promotional material available online, that procurement can be used as a strategic tool to encourage

new solutions and give more responsibility to contractors (Trafikverket, 2019). The goal of this shift towards promoting collaboration and innovation in projects is also to increase competition, as well as to involve contractors in early stages to improve coordination and efficiency in the projects (Eriksson, Lingegård, Borg & Nyström, 2017).

2.4.6. Categorisations of Cities

In order to develop transport infrastructure that meets local and regional needs, it is essential to understand the functional differences between municipalities of varying sizes. One way to achieve this is by categorizing Swedish municipalities based on population size and commuting patterns (Sveriges Kommuner och Regioner, 2022). According to the classification by Swedish Association of Local Authorities and Regions (SALAR), which was established in close accordance with EuroStat, municipalities are divided into three main groups: (A) large cities and metropolitan municipalities, (B) medium-sized towns and their surrounding areas, and (C) smaller towns and rural municipalities. Below follows the classification in table 1.

Table 1. Classification of Swedish municipalities (Swedish Association of Local Authorities and Regions, 2023)

Category	**Definition**
A. Large cities and municipalities near large cities	
A1. Large cities	"*Municipalities with a population of at least 200 000 inhabitants with at least 200 000 inhabitants in the largest urban area.*" (SALAR, 2023).
A2. Commuting municipalities near large cities	"*Municipalities where more than 40 % of the working population commute to work in a large city or municipality near a large city.*" (SALAR, 2023).
B. Medium-sized towns and municipalities near medium-sized towns	
B3. Medium-sized towns	"*Municipalities with a population of at least 50 000 inhabitants with at least 40 000 inhabitants in the largest urban area.*" (SALAR, 2023).
B4. Commuting municipalities near medium-sized towns	"*Municipalities where more than 40 % of the working population commute to work in a medium-sized town.*" (SALAR, 2023).

B5. Commuting municipalities with a low commuting rate near medium-sized towns	"*Municipalities where less than 40 % of the working population commute to work in a medium-sized town.*" (SALAR, 2023).
C. Smaller towns/urban areas and rural municipalities	

2.5. Decision-Making Basis in Infrastructure Development

As mentioned in the previous section, throughout each phase of a project's timeline decisions are made, these decisions constitute a decision-making process. The decision-making process in Swedish infrastructure development is guided by a range of legal and analytical tools that ensure sustainability, efficiency, and social responsibility. These include Environmental Impact Assessment, The Convention on the Rights of the Child, Comprehensive Impact Assessment, Socio-economic analysis, Decision-making implications from consultation and Integration of SIA, all of which help integrate environmental, economic, and social considerations into planning.

Whether the tools are mandatory or not depends on how they are defined through laws or regulations. This is illustrated in Figure 2 below, which shows a timeline indicating when the different documents are introduced throughout the project and whether they are a legal requirement, a legal recommendation, or solely based on the initiative of the project team.

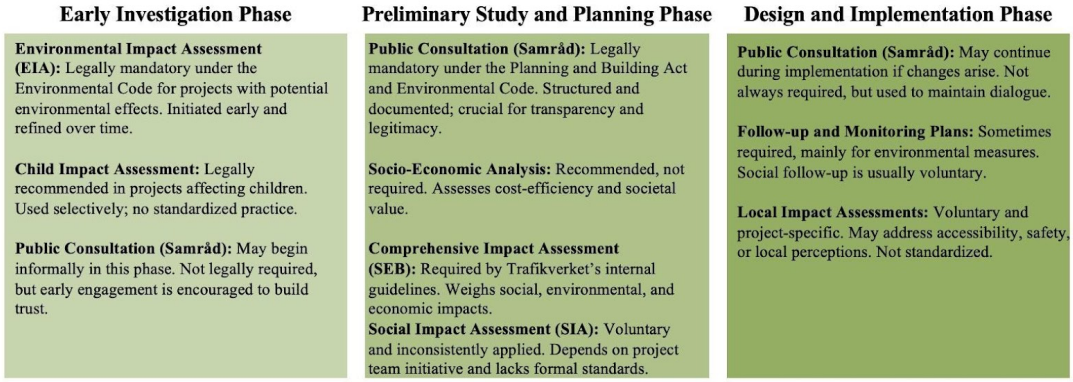

Figure 2. Overview of key decision-making tools used in Swedish infrastructure planning, organized by project phase and legal status.

The following sections present them in order based on the extent to which they are mandatory.

2.5.1. Environmental Impact Assessment

The Swedish Environmental Code (SFS 1998:808) serves as the cornerstone of Sweden's environmental legislation, aiming to foster sustainable development and safeguard both human health and the environment. This comprehensive code consolidates various environmental statutes into a unified framework, ensuring that activities, including construction projects, are conducted responsibly with minimal ecological impact.

Under the Swedish Environmental code, construction projects that may have a significant environmental impact must adhere to strict requirements to minimize harm and promote sustainability (Miljöbalken SFS 1998:808). It mandates that developers are obligated to take preventive measures to reduce environmental risks, following the precautionary principle. If a project is expected to have substantial environmental consequences, an environmental impact assessment (in Swedish: Miljökonsekvensbeskrivning, MKB) must be conducted. This assessment evaluates the project's potential effects on biodiversity, water resources, and cultural heritage, ensuring that environmental factors are considered in decision-making (Miljöbalken SFS 1998:808). To ensure compliance, supervisory authorities oversee project activities and enforce regulations. In cases of non-compliance, sanctions such as fines or project suspensions may be imposed to prevent environmental harm and uphold the principles of Miljöbalken (Naturvårdsverket, n.d.).

2.5.2. The Convention on the Rights of the Child

Since the first of January of 2020 the Convention on the Rights of the Child (CRC) from the UN has been a law in Sweden (SFS 2018:1197). In Part 1, Article 3.1 it says:

> *"In all actions concerning children, whether undertaken by public or private social welfare institutions, courts of law, administrative authorities or legislative bodies, the best interests of the child shall be a primary consideration."*
>
> *(SFS 2018:1197, Part 1 Article 3.1)*

To ensure proper implementation of the CRC, the Ombudsman for Children in Sweden has developed methodological support and guidelines for conducting child impact analyses (Barnombudsmannen, 2021a; Barnombudsmannen, 2021b). These analyses aim to ensure that the best interests of the child are actively considered in all relevant decisions. In the context of urban planning and infrastructure development, Boverket emphasizes that child impact analyses (in Swedish: barnkonsekvensanalyser, BKA) are especially relevant for actors such as municipalities, regions, and agencies like Trafikverket (Boverket, 2024a). A BKA helps identify how planning, design, and management of physical environments, such as transport systems and public spaces,

affect children and young people. According to Boverket (2024a), it highlights both positive and negative consequences and supports decisions that improve children's living conditions in both the short and long term. Child impact analysis is intended to be a practical and integrated part of standard planning routines, providing a structured way to apply the CRC in fields such as construction, traffic planning, and infrastructure development.

2.5.3. Comprehensive Impact Assessment

Within the Trafikverket, a reporting method called comprehensive impact assessment (in Swedish: samlad effektbedömning, SEB). Comprehensive impact assessment is applied as a decision-making tool aimed to support planning, decision-making, and follow up by analyzing how different measures contribute to transport policy objectives (Trafikverket, 2024b). A SEB is conducted according to Trafikverket's routine description (TDOK 2015:0109) to analyze and summarize the effects of a transport measure, and includes three main areas of analysis, cost benefit analysis, transport policy goal analysis, and distributional analysis (Trafikverket, 2024b; Trafikverket, 2025a). The process begins with a project manager initiating the assessment and assembling the necessary expertise, a description of the current situation and the proposed measure is then prepared and reviewed by experts (Trafikverket, 2024b). The SEB is subsequently reviewed at both regional and national levels to ensure compliance and reliability. Once approved, it is published and serves as a basis for future infrastructure decisions.

A SEB functions as an objective decision-making tool rather than a weighted recommendation, distinguishing it from other analyses (Trafikverket, 2024c). It is not a one time assessment but should be continuously updated throughout a project's lifecycle, including revisions during construction start reporting and action planning. SEB is applied in both measure selection studies and planning processes, with strict methodological requirements set by Trafikverket. The use of specific templates and methods is mandatory, and the assessment must undergo publication and quality assurance according to established guidelines (Trafikverket, 2024c).

2.5.4. Socio-economic Analysis

According to regulation SFS 2010:185, Trafikverket is required to use socio-economic analyses as a central part of long term infrastructure planning. The socio-economic analysis, or Cost-Benefit Analysis (CBA), serves as Trafikverket's main tool for assessing whether transport measures are effective from a societal perspective, meaning a social relations perspective (Trafikverket, 2016). According to Trafikverket (2016), by weighing all relevant costs and benefits, both those with market prices and those without, the analysis provides a basis for prioritizing projects that generate the greatest societal benefit relative to their cost. CBA takes into account effects on travelers,

operators, other road users, citizens, and the environment, and includes factors such as travel time savings, reduced traffic accidents, noise, emissions, as well as maintenance and operational costs (Trafikverket, 2016). However, Trafikverket (2016) notes that the analysis has certain limitations, particularly concerning issues of equity and long term sustainability, and is therefore complemented by other types of assessments in the planning process.

2.5.5. Decision-Making Implications from Consultation

Consultation, which is a form of citizens dialogue, is an essential part of the planning process and detailed development planning, where stakeholders are given the opportunity to access information and provide feedback at an early stage (Trafikverket, 2024d). It aims to create an open dialogue between authorities, stakeholders and the public to ensure that different perspectives and knowledge are considered. Consultation is a mandatory part of the planning process and contributes to a more transparent and inclusive decision-making process, in accordance with Plan- och bygglagen (SFS 2010:900, 7 kap. 5 §), which is the Swedish law for planning and construction. In railway projects, Trafikverket plays a central role in coordinating consultations, documenting relevant viewpoints, and integrating them into the continued planning process.

At Trafikverket, the consultation process follows a structured approach to ensure transparency, inclusivity, and effective stakeholder engagement (Nilsson & Holdar, 2011; Trafikverket, 2024d). According to Trafikverket (2024c), through this process, authorities, organizations, and citizens are given the opportunity to provide input that may influence the project's design. This enables the identification of potential challenges and the development of solutions before decisions are made, ensuring a more balanced consideration of different interests. The consultation often addresses key issues such as environmental impact, land use, and social consequences (Trafikverket, 2024d).

Nilsson and Holdar (2011) describes the process surrounding consultation at Trafikverket in different steps, following in this paragraph. In Trafikverkets projects, the consultation begins with preparation and planning, where relevant stakeholders are identified. A communication plan is developed to define the purpose, target audience, and suitable consultation methods. The next phase is implementation, which includes information dissemination, where Trafikverket presents the project's purpose, potential impacts, and alternatives through meetings, exhibitions, or digital platforms. This is followed by dialogue and feedback collection, allowing stakeholders to express their views through discussions, questions, and written submissions. According to Nilsson & Holdar (2011) all input is documented in a consultation report, summarizing received feedback and explaining how it has been considered in the planning process, including

any necessary adjustments to the project. After the consultation, Trafikverket conducts an evaluation and follow-up to assess the effectiveness of the process, identify areas for improvement, and analyze participation levels. The results are then communicated back to stakeholders to ensure transparency (Nilsson & Holdar, 2011).

2.5.6. Integration of Social Impact Assessment

Previous research by Antonson and Levin (2020) has found that SIA is not a mandatory part of the transport infrastructure planning process in Sweden, and it is often treated as an optional or ad hoc component. They found that social aspects are sometimes considered during Environmental Impact Assessments (EIA), but this is largely driven by the individual initiatives of municipalities or consultants rather than being guided by a consistent framework. This lack of standardized practices leads to social impacts being insufficiently integrated into the planning and decision-making processes, particularly regarding issues like accessibility, health, and community cohesion (Antonson & Levin, 2020).

Further, Antonson and Levin (2020) emphasize that Sweden would benefit from the establishment of a formalized SIA framework, which could ensure consistency and facilitate better integration of social considerations in transport planning. They suggest creating an external network to connect stakeholders involved in the EIA process, which would promote the development of a structured approach to assessing social impacts. This recommendation is based on the growing importance of SIA in infrastructure projects globally, where it is often a mandated component of the planning process (Antonson & Levin, 2020).

3. Theoretical Framework

This chapter presents the theoretical framework that underpins the study of social sustainability in double-track railway infrastructure projects in Sweden. As shown in chapter 2.5.6, within the legal framework established in Sweden through laws and regulations there is no defined or established methodology for how to assess social impact or doing social impact assessments. Therefore, the theoretical framework draws primarily on Social Impact Assessment as defined by Vanclay (2003), complemented by Stakeholder Theory (Freeman, 1984), and Arnstein's Ladder of Participation (1969). This framework enables the analysis of how social impacts are identified, prioritized, and influenced by decision-making processes and stakeholder dynamics within the context of infrastructure development. Therefore, the theoretical framework draws primarily on Social Impact Assessment as defined by Vanclay (2003), complemented by Stakeholder Theory (Freeman, 1984), and Arnstein's Ladder of Participation (1969). These well-established theories form the foundation for the study's analytical lens and are widely recognized within the academic literature: Arnstein's work has been cited over 8,500 times, Vanclay's key publications over 450 and 530 times respectively, and Freeman's original stakeholder model over 180 times. This framework enables the analysis of how social impacts are identified, prioritized, and influenced by decision-making processes and stakeholder dynamics within the context of infrastructure development. SIA provides the overarching structure for assessing social effects, while Stakeholder Theory clarifies the roles and power of involved actors. Arnstein's Ladder complements this by illustrating the degree of participatory influence. Together, these theories enable a holistic analysis of both impact and agency.

SIA has its origins in NEPA (National Environmental Policy Act), which was the first major environmental legislation in the United States and required authorities to assess the environmental effects of their proposed actions before making decisions (Antonson & Levin, 2020). Antonson and Levin (2020) highlight that since 1969 the process has evolved and been adapted, with SIA gradually becoming mandatory in many countries. They state that interest in SIA grew during the 1990s in connection with the effects of urbanization on communities, particularly in relation to infrastructure. Concepts such as social exclusion and inclusion became increasingly common as it became evident that poor access to transportation contributed to increased social exclusion (Antonson & Levin, 2020). In Swedish infrastructure projects, SIA has long been an underdeveloped area with slow implementation, especially in comparison to environmental assessments (Antonson & Levin, 2020). In recent years, stakeholders in the infrastructure sector have developed their own methods to better understand and measure social impacts in infrastructure projects. This shift reflects a growing recognition of the need for more robust frameworks in understanding social outcomes.

Table 2 below provides a brief overview of the 12 impact categories from the International Institute for Sustainable Development (2016), based on Vanclay's (2002) description of social impact assessment. These impact categories are explained further and with reasoning about how important each category is in the context of infrastructure in section 3.2.1 to 3.2.12.

Table 2. Social impact categories

Impact Category	Description
Demographic changes	Evaluates how population growth, migration, and shifts in age distribution impact society.
Labor market and economy	Assessing how employment, wage levels, and local businesses develop as a result of a project.
Access to social services	Access to social services, such as educational facilities, healthcare, and social support. A growing population can put pressure on existing resources, potentially requiring new investments to maintain a good standard of living.
Infrastructure and housing	Affects on the housing market, transportation options, and access to essential services such as water, electricity, and sanitation.
Cultural impact	Examines impact on culture, with external influences can alter traditions, language, religious beliefs, and social norms, potentially creating tensions between different social groups.
Lifestyle and daily life	Examines work routines, leisure activities, and social relationships shifts due to the project's influence.
Environmental-related social effects	Analyses how the project impacts access to natural resources such as water, land, and fish stocks. Can have direct consequences on livelihoods and food prices, potentially leading to economic and social disparities growing.
Safety and crime	A crucial factor, as rapid social changes can sometimes contribute to increased crime rates and social unrest.
Political influence and participation	Examines how the local population’s ability to influence decisions is affected by the project. Power dynamics may

	shift from local actors to external investors, creating inequalities in influence and decision-making.
Land use and resource distribution	Examines who has access to land and natural resources, and their plentitude.
Attitudes and acceptance of the project	Analyzing how different groups within a society act towards a project, usually depending on their feeling of threat against cultural or economic opportunities.
Health and well-being	Assessed with consideration to both physical and psychological aspects, including changes in working conditions, social security and access to healthcare.

By identifying these different areas of impact, an SIA provides a comprehensive understanding of how a project can affect people and communities. The results are used to detect potential issues early, develop strategies to address them, and ensure that development takes place in a socially sustainable manner, with the needs and interests of the local population at the forefront.

3.1. Social Impact Assessment as the Core Framework

SIA is not only a tool or method for assessing a set of predefined aspects, but rather a paradigm which entails both a body of knowledge, techniques, and values (Vanclay, 2003). SIA should not merely be seen as the task of predicting social impacts, but as a broader process aimed at understanding and managing the social consequences of interventions. According to Vanclay (2003), SIA is defined as:

> *"*Social Impact Assessment includes the processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment.*"*
>
> - *Frank Vanclay (2003)*

This definition was developed for the International Association for Impact Assessment (IAIA) through extensive workshops involving over 50 experts (Vanclay, 2003). Vanclay's aim is to provide a set of guiding principles for SIA and the consideration of social factors in environmental impact assessments. He emphasizes that SIA promotes proactive development, focusing on creating positive outcomes rather than merely

mitigating negative or unintended consequences. Furthermore, it seeks to empower communities and strengthen social capital through participatory processes (Vanclay, 2003).

Vanclay also asserts that SIA is not limited to regulatory frameworks, but applies to a wide range of interventions and can be used by various actors. By incorporating local knowledge and stakeholder involvement, SIA fosters adaptive management and informs the design and implementation of projects (Vanclay, 2003). Additionally, it underscores the interconnectedness of social, economic, and ecological impacts, urging an understanding of how changes in one area may trigger effects in others. The role of SIA is to complement the economic and technical evaluation models that typically dominate professional and agency practices (Vanclay, 2003). Rather than simply predicting who benefits and who loses, SIA also focuses on:

> *"empowerment of local people; enhancement of the position of women, minority groups and other disadvantaged marginalised members of society; development of capacity building; alleviation of all forms of dependency; increase in equity; and a focus on poverty reduction."*
>
> - *Frank Vanclay (2003)*

The goal of SIA is to promote social value and sustainable development that aligns with the needs and expectations of the community (Vanclay, 2003). This includes prioritizing the maintenance of living standards after disruptions and safeguarding the well-being of the wider community. Special attention is given to vulnerable populations, ensuring their needs are addressed. Many modern frameworks for SIA are built upon Vanclay's early work from the 2000s, which has largely incorporated earlier contributions (Vanclay, 2003; International Institute for Sustainable Development, 2016).

3.1.1. Social Impact

Vanclay (2003) argues that social impact extends far beyond demographic changes, job creation, financial matters, or impacts on family life. It encompasses a wide range of issues that affect people directly or indirectly, including changes to their way of life, how they live, work, interact, and engage in leisure activities. Social impacts also involve cultural elements such as shared beliefs, customs, values, and language, as well as the cohesion, stability, and character of communities.

Moreover, social impacts influence political systems, affecting people's ability to participate in decision-making and the level of democracy. Environmental changes, such as air and water quality, food availability, and exposure to risks, are also relevant

within the scope of SIA. The health and well-being of individuals, including their physical, mental, social, and spiritual health, are integral considerations. Additionally, SIA addresses personal and property rights, particularly in cases of economic disadvantage or civil rights violations. Lastly, social impacts encompass people's fears and aspirations, including concerns about safety, community futures, and hopes for subsequent generations (Vanclay, 2003).

3.1.2. Core Values and Principles

SIA is underpinned by a set of core values that should guide its practice (Vanclay, 2003). These include fundamental human rights, equality across gender and culture, and the protection of those rights under the law. People have the right to live and work in environments that promote good health, quality of life, and the development of human and social potential. Key social dimensions such as peace, social relationships, freedom from fear, and a sense of belonging are vital to well-being. Furthermore, individuals have the right to participate in decision-making processes regarding interventions that impact their lives (Vanclay, 2003). Local knowledge and experience are valuable resources that can enhance planning and ensure more culturally relevant outcomes.

These core values are translated and developed into principles, creating a shared understanding that guides decision-making and actions (Vanclay, 2003). Vanclay (2003) brings up a couple of different essential principles. For example, the Uncertainty Principle acknowledges the limitations of our knowledge about the social world, emphasizing the need for adaptive approaches in planning. The Principle of Multisectoral Integration highlights the importance of incorporating social considerations into all projects and policies. The Polluter Pays Principle ensures that the burden of addressing social impacts falls on those responsible for the intervention. Furthermore, he also highlights Intragenerational Equity which calls for fair distribution of benefits, particularly focusing on vulnerable groups, while the Principle of Subsidiarity supports decentralized decision-making, empowering local communities. Lastly, the Protection and Promotion of Health and Safety emphasizes prioritizing public health, requiring that risks be minimized and vulnerable groups be safeguarded from harm. Together, these principles guide effective and socially responsible planning and intervention (Vanclay, 2003).

3.1.3. SIA Guidelines in Infrastructure

Vanclay (2003) writes that because guidelines are specific recommendations for action, they need to be developed in the context in which they are to be applied and should be addressed to a specific audience. Therefore, they must be created in collaboration with the relevant stakeholders to ensure they are accepted and tailored to the needs of that group, rather than being imposed externally (Vanclay, 2003).

Building on this, SIA in infrastructure projects is an essential tool for integrating social considerations into both planning and development. However, there is no unified methodology for assessing social impacts in infrastructure projects (Zamojska & Próchniak, 2017), and SIA is not systematically implemented in transport infrastructure planning in Sweden (Antonson & Levin, 2020). Despite Sweden's reputation for a strong welfare system, Antonson and Levin's review of 18 environmental impact statements and six handbooks reveals that social issues are inconsistently addressed, often limited to health and accessibility, and largely absent from more recent planning documents. Moreover, there is no national coordination or institutional framework to support SIA, leaving municipalities and consultants to develop their own ad hoc approaches. This fragmentation creates uncertainty and hinders cumulative learning across projects (Antonson & Levin, 2020).

The lack of national guidelines is not unique to Sweden. Zamojska and Próchniak (2017) emphasize that this gap is visible across much of Europe, where SIA remains underdeveloped compared to environmental and economic assessments. They stress the importance of stakeholder theory for understanding and managing social impacts, since different groups perceive and experience infrastructure changes differently. Stakeholder theory (Freeman, 1984) argues that all individuals or groups affected by a project have a legitimate stake in its outcome. This theory supports the idea that power dynamics among stakeholders influence which impacts are prioritized. In the context of railway infrastructure, actors such as policymakers, transport agencies, consultants, and local communities all play a role in shaping decisions that affect social outcomes. Furthermore, evaluating whether stakeholder engagement is symbolic of genuinely empowering, assessing the depth and authenticity of stakeholder involvement can be done with Arnstein's *Ladder of Participation* (1969), which gives a framework for involvement of underrepresented groups in decision-making. The framework is divided into eight rungs from non-participation to full citizen control, it will be used to assess how consultation and other parts of decision-making include the people whose lives are affected. Arnstein's (1969) ladder is presented below in table 3.

Table 3. Arnstein's ladder of participation (1969)

Rung	Level of participation	Description	Citizen power
8	Citizen control	Citizens have full managerial power over plans, policies, and implementation. They set the terms for participation.	Full control
7	Delegated power	Citizens have dominant decision-making authority in specific programs or policies. Powerholders must negotiate.	Significant power
6	Partnership	Citizens and powerholders share planning and decision-making through structured negotiations.	Shared power
5	Placation	Citizens may advise or influence decisions, but powerholders still make final calls. Often includes token citizen representatives.	Limited influence
4	Consultation	Citizens' opinions are requested (e.g., surveys, hearings), but there is no obligation to act on them.	No real influence
3	Informing	One-way communication: citizens are told what is happening or planned, with no opportunity for feedback.	No influence
2	Therapy	Participation is used to "fix" or "cure" citizens rather than include them in decisions. Often patronizing.	Misleading
1	Manipulation	Citizens are misled or used to legitimize decisions already made by powerholders. No real involvement.	None

3.2. Social Impact Categories and Their Effect on Railway Infrastructure

Below follows descriptions of the 12 impact categories from the International Institute for Sustainable Development (2016) which builds on, and concretizes Vanclay's (2002) definition of social impact together with a reasoning on how each impact category can be linked to railway infrastructure.

While Vanclay (2003) outlines twelve impact categories, this study primarily focuses on six (demographic changes, access to social services, lifestyle and daily life, environmental-related social effects, safety and crime, political influence and participation) as they align most closely with the case-specific stakeholder discussions. The remaining categories were reviewed but found to have limited empirical relevance in the selected projects.

3.2.1. Demographic Changes

According to Vanclay (2002), demographic changes refer to changes in the characteristics of the population within an affected area, such as population size, age, or diversity. It may also include immigration, emigration, or the presence of temporary workers, and these changes can put pressure on local resources or alter the social structure of the community (Vanclay, 2002). Thereby, Vanclay (2002) argues that demographic changes can impact social sustainability by, for example, creating strain on local resources and services, which reduces access to important community resources such as housing and healthcare. Significant changes can also challenge social cohesion by creating tensions between different groups, leading to segregation and decreased integration (Vanclay, 2002).

Demographic changes are directly linked to the development of the railway network, as it can contribute to immigration and emigration of the population, thereby changing the population size in an area. Furthermore, it can also lead to both segregation, if, for example, the railway causes housing prices to become too high for people to remain in the area, and integration through growth and an increased population in the area.

3.2.2. Labor Market and Economy

Labor market and economy encompasses the economic effects of a project, such as job creation, changes in income, or changes in employment patterns (Vanclay, 2002). Vanclay (2002) continues by specifying that it impacts social sustainability by creating new economic opportunities or complicating access to jobs, which can affect individuals' economic well-being. He exemplifies that job creation can lead to increased employment and improved living standards, but if the jobs are low-wage or insecure, it can lead to economic inequality. Furthermore, labor market and economy include

economic processes such as inflation or transformation of economic activities, which can lead to both positive and negative consequences for individuals and society at large (Vanclay, 2002). Vanclay argues that the transformation of economic activities, such as a shift from agriculture to industry, can generate economic growth but also lead to unemployment in certain sectors and social insecurity for those who cannot adapt. Inflation can further undermine social sustainability by reducing people's purchasing power and increasing socioeconomic disparities.

In relation to railway infrastructure, the introduction of new or improved transportation options is expected to enhance residents' access to a broader range of employment opportunities in other areas. Additionally, job opportunities are created during the construction phase of such projects. However, beyond these immediate effects, this impact category is not considered to be of primary importance within the context of infrastructure development.

3.2.3. Access to Social Services

Vanclay (2002) defines access to social services as the availability and quality of services such as healthcare, education, and public services. He explains that the outcome of large-scale projects can either strain existing services or lead to their expansion to meet the increased demand. According to Vanclay (2002), access to social services is a key factor in achieving social sustainability and ensuring that all citizens have access to essential public services. If a project leads to increased demand for these services without expanding the resources, he argues, it can result in system overload and unequal access to vital services. This, as Vanclay (2002) points out, can create social tensions and exacerbate inequalities between different groups. On the other hand, he suggests that expanding services to meet the increased demand can contribute to a more equitable distribution of resources and strengthen the community's social cohesion and sustainability.

Railway infrastructure plays a central role in improving access to social services, particularly in smaller towns. By connecting smaller locations to larger cities with efficient railway transport, residents can gain closer access to important community resources such as healthcare, education, and public services. This can contribute to increased equality and social integration, especially for those living in remote areas who have previously had limited access to such resources. For this positive development to be realized, it is essential that the infrastructure not only expands but also adapts to meet the specific needs of smaller communities, and that services in the larger cities can handle the increased demand.

3.2.4. Infrastructure and Housing

Infrastructure and housing affect the physical conditions and social cohesion of a community (Vanclay, 2002). According to Vanclay (2002), changes in transportation infrastructure and housing can lead to improvements in quality of life and accessibility, but they can also cause disruptions if not managed properly. Housing issues, such as adequacy and availability, are also part of this category and influence both physical conditions and social cohesion. He suggests that if access and quality do not meet the needs of the population, it can create social tensions.

Infrastructure and the housing market are directly affected by railway expansion. Improved railway infrastructure makes the transportation of people and goods faster and more accessible, which can change the physical conditions of the community. This can have both positive and negative effects on the housing market. On one hand, the increased access to transport can lead to higher demand for housing in areas near stations and railway lines, which in turn can stimulate housing construction and economic growth. On the other hand, it can also lead to inequalities if housing availability does not meet demand, potentially creating housing segregation and social tensions. Therefore, it is crucial to plan for both infrastructure and housing with a long-term, sustainable, and inclusive strategy.

3.2.5. Cultural Impact

Cultural impact involves changes in norms, traditions, language, and heritage, often as a result of external influences such as migration or tourism (Vanclay, 2002). According to Vanclay (2002), cultural impact can have both positive effects, such as the introduction of new cultural practices, and negative consequences, such as the loss of local traditions and cultural values. He argues that if these changes are not handled respectfully, they can threaten the cultural integrity and social cohesion of communities.

Cultural impact, while important, is not directly linked to railway infrastructure development in the same way as other factors, such as accessibility or economic growth. Although new railway connections may indirectly influence the movement of people and ideas, which could bring about cultural changes, these effects are often more closely tied to broader societal shifts such as migration or tourism, rather than the railway infrastructure itself. As such, the cultural impacts are typically secondary to the direct social and economic impacts of railway projects, making them less central to the core focus of this study.

3.2.6. Lifestyle and Daily Life

The impact category lifestyle and daily life involves how people live, work, and integrate into society (Vanclay, 2002). Vanclay (2002) explains that this can include changes in daily routines, recreational activities, or social structures. If a project leads to improved living conditions, such as increased access to recreational activities or stronger social networks, he suggests it can positively contribute to the sustainability of the community. However, if the changes lead to social isolation, stress, or decreased quality of life, Vanclay (2002) warns that it can weaken social cohesion and threaten social sustainability.

Commuting, especially between smaller towns and larger cities, affects people's lifestyle and daily routines in many ways. By facilitating commuting through rail, the workforce and social structure can change, as people gain greater access to work and activities in larger cities, which increases social and economic mobility. For individuals in smaller towns, improved transportation options can mean better access to the job market, education, and recreational activities. This can improve quality of life and reduce geographical and social barriers. However, new railways through areas can also create primarily physical barriers, which makes this impact category particularly important to consider when planning railway infrastructure.

3.2.7. Environmental-related Social Effects

Environmental-related social effects impact social sustainability by causing environmental changes such as pollution, land degradation, or changes in ecosystems, which can have direct consequences for people's health, livelihoods, and social structures (Vanclay, 2002). According to Vanclay (2002), when the physical environment deteriorates, it can lead to health issues, lost livelihood opportunities, and social inequalities, especially if certain groups are disproportionately affected.

In railway projects, it is crucial to work with social, economic, and ecological sustainability in parallel, as these dimensions are deeply interconnected and influence each other. Environmental impact assessments (EIA) primarily focus on environmental aspects, but social and economic factors are also taken into account. EIAs help to identify and manage the impacts a project may have on both the environment and communities, ensuring that sustainability goals for all three dimensions are considered and balanced effectively.

3.2.8. Safety and Crime

Safety impact includes both physical safety, such as an increased risk of traffic accidents or health hazards, and social safety, which involves crime or a sense of insecurity (Vanclay, 2002). Large projects, especially those involving construction workers or temporary residents, can exacerbate these issues, leading to social tensions.

Safety and crime are directly linked to the design of the built environment and infrastructure. Railway projects that alter the physical structure of a community can affect social security. A well-designed railway station and its surroundings can help reduce crime and increase social safety by creating open, well-trafficked areas. If the physical environment is not considered and safe environments are not created, it can instead lead to increased insecurity and social problems. This aspect is crucial to address through thoughtful design and involving the community in the planning process.

3.2.9. Political Influence and Participation

The impact category of political influence and participation examines the degree of political engagement and decision-making influence within the affected community (Vanclay, 2002). According to Vanclay (2002), political influence and participation affect social sustainability because the level of political engagement and decision-making influence can strengthen or weaken social cohesion within communities. He suggests that if a project enables increased participation and influence in decision-making processes, it can strengthen democratic values and enhance community engagement. However, if the project marginalizes certain groups by limiting their ability to influence decisions, Vanclay (2002) warns that it can create feelings of injustice and dissatisfaction, undermining social sustainability and leading to increased social fragmentation.

Political influence and participation are important for social sustainability in relation to railway infrastructure, as dialogue with stakeholders, through processes such as consultations, can influence how a project is designed and implemented. By including stakeholders, such as local communities, political actors, and businesses, in the decision-making process, transparency can be increased and trust in the project can be built. Participation from citizens and other stakeholders can also lead to the project being better tailored to the needs and conditions of the local community. If these processes are not managed effectively, it can lead to political marginalization, which risks creating resistance and undermining social sustainability.

3.2.10. Land Use and Resource Distribution

Land use and resource distribution affect social sustainability by causing changes in how land and natural resources are used and distributed, which can lead to unequal access to important resources such as water and land (Vanclay, 2002). Vanclay (2002) explains that if resource distribution is uneven, it can create tensions and conflicts between different groups or sectors within society, undermining social cohesion and stability. He also suggests that unequal access to resources can exacerbate socioeconomic disparities, threatening long-term social sustainability.

The impact of land use and resource distribution is less relevant in the context of railway infrastructure in Sweden. While the amount of land required for construction, such as issues related to land rights (e.g., eminent domain), is an important consideration, the distribution of natural resources is less directly affected by railway projects. In Sweden, land use concerns are typically more focused on land acquisition for the railway tracks, stations, and supporting infrastructure rather than the distribution of natural resources. Therefore, this category is less critical when considering the broader impacts of railway development in Sweden.

3.2.11. Attitudes and Acceptance of the Project

Public perception and acceptance of a project are central to the impact category. This encompasses how different stakeholders view the project's necessity, potential benefits, and possible negative effects (Vanclay, 2002). According to Vanclay (2002), positive or negative attitudes can have a significant impact on the project's implementation and long-term integration into the community. He explains that attitudes and acceptance of the project affect social sustainability, as public perception and support from various stakeholders can determine how well the project is integrated into society. If the project is perceived as necessary and beneficial, Vanclay (2002) suggests it can strengthen social cohesion and contribute to long-term sustainability. However, if the project faces strong opposition or negative attitudes, he warns that it can create social tensions and conflicts, weakening community stability and hindering the success of the project.

In the context of railway infrastructure, the category Attitudes and Acceptance of the Project is effectively covered by Political Influence and Participation, as the latter involves how stakeholder engagement, including political dialogue and consultations, shapes the public's perception and acceptance of the project.

3.2.12. Health and Well-being

Health and well-being affect social sustainability as changes in physical health, social, and mental well-being have a significant impact on individuals' quality of life and community stability (Vanclay, 2002). Vanclay (2002) explains that projects can improve health through better access to healthcare or improved living conditions, but they can also have negative effects, such as environmental pollution or lifestyle changes that lead to deteriorating health. He argues that if health issues are not addressed, it can create inequalities and increase social tensions, threatening long-term social sustainability.

In the context of railway infrastructure, health and well-being, while important, are somewhat less directly relevant due to the specific focus of this study. While factors such as noise pollution (e.g., from trains) can indeed affect health, this is more comprehensively covered under Lifestyle and Daily Life, which addresses how changes in daily routines, social structures, and environmental factors, like noise, influence individuals' overall well-being.

4. Methodology

The methodology chapter outlines the approach taken to address the purpose of the study. The methods were selected to provide a robust foundation for exploring the study's objectives, primarily drawing on literature and documents relevant to the topic. A structured, qualitative, case study-based design with a multi-method approach (Bryman & Bell, 2017) was employed to ensure a comprehensive analysis of the research questions. This approach combined various techniques, including a literature review, case studies, and interviews to gather data.

The case studies of the double-track expansion of Gothenburg-Trollhättan and Ängelholm-Maria explored specific instances and provided empirical context for the research. Using both document analysis and interviews, quantitative data on the cases and qualitative insights from stakeholders in both projects and experts in the field could be obtained. Using these multiple methods strengthened the validity of the findings through triangulation, ensuring a more accurate and comprehensive understanding of the research problem (Bryman & Bell, 2017).

The multi-method approach allowed for flexibility, adapting to findings throughout the data collection process. This adaptability was a key characteristic of qualitative research, particularly in case studies (Bryman & Bell, 2017), where complex real-world phenomena were explored. The insights gained from the literature, case studies, and interviews were analyzed together to address the research questions effectively.

4.1. Thesis Strategy, Case Study

Sweden has invested in railway infrastructure in recent decades to increase capacity, improve punctuality, and enhance regional accessibility. Several double-track expansions have been implemented to meet growing transport demand and promote sustainable travel. This study conducted two case studies analyzing the contributions to social sustainability of two similar projects: the double-track expansions between Gothenburg–Trollhättan and Ängelholm–Maria in Helsingborg. Both projects were essential parts of Sweden's railway network and were selected because they represented two similar yet distinct railway development initiatives in comparable regions. See their geographic relation to each other in the figure 2 below.

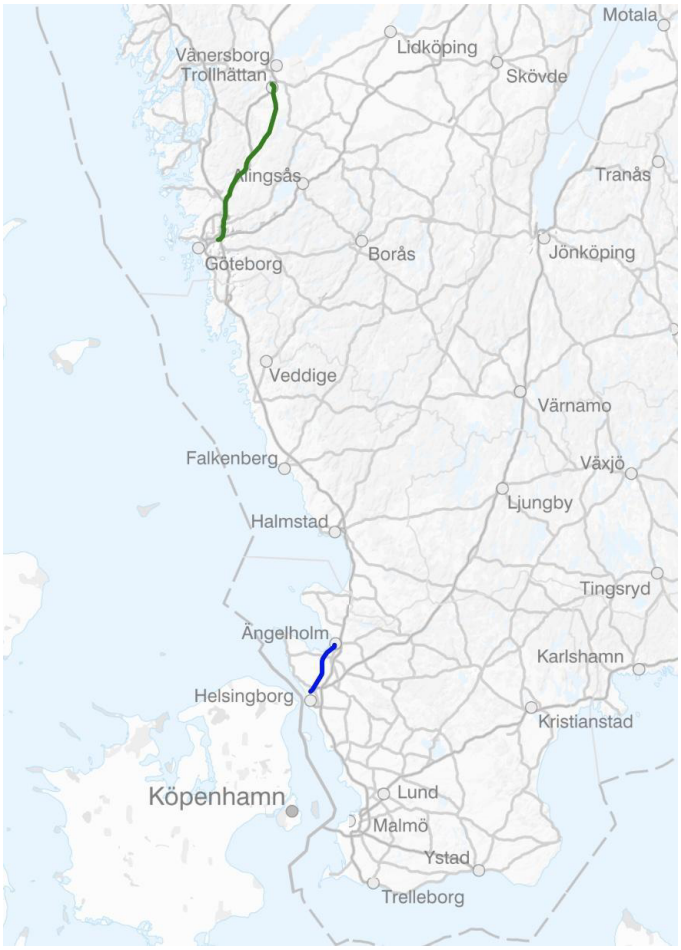

Figure 2. Map created using the Swedish mapping service Min Karta (Lantmäteriet, n.d.), showing the two case study projects Ängelholm–Maria (blue) and Gothenburg–Trollhättan (green), and their geographical relation to each other.

The Gothenburg–Trollhättan project was part of the larger infrastructure program BanaVäg i Väst, where both railway and highway were expanded in parallel. It was carried out between 2004 and 2012 with a total budget of approximately 12 billion SEK and aimed to improve capacity and travel times along the crucial Norge/Vänernbanan railway, a trunk railway in Sweden. The Ängelholm–Maria project, part of the Västkustbanan, which also was one of the major trunk railways in Sweden, started much later, in 2020, and was completed in 2024 with a budget of just over one billion SEK. Despite differences in timelines, budgets, and scopes, both projects shared the common goal of increasing railway capacity and improving connections between cities of similar size.

In line with Flyvbjerg's (2011) typology of strategic case selection, the Gothenburg–Trollhättan and Ängelholm–Maria projects were chosen as paradigmatic cases. These projects were not selected for their extremity or deviation, but for their capacity to exemplify broader patterns in Swedish railway infrastructure development, where national transport objectives intersect with regional and municipal planning. A key reason for selecting these two cases was their distinct geographical and demographic

contexts, which allowed for comparisons of how double-track expansions impacted different types of urban and commuting regions. The Gothenburg–Trollhättan project affected both larger and smaller municipalities, including Gothenburg (classified as A1 according to SALAR, 2023), Trollhättan (B3), Ale (A2), and Lilla Edet (A2). In contrast, the Ängelholm–Maria project involved Helsingborg (B3) and Ängelholm (B4), focusing on a different type of regional and commuter dynamic. These settings provided valuable contrasts for exploring how social sustainability considerations were integrated into infrastructure decision-making processes. According to Flyvbjerg (2011), a case study is an intensive investigation of a specific unit, aiming to gain deeper insight into the dynamics shaping its development. Following Bryman and Bell's (2017) methodological guidance, both cases were examined using consistent methods, enabling a comparative analysis of how decision-making models and project execution influenced socially sustainable outcomes. The case studies thus offered a rich, contextual understanding that was essential for drawing broader conclusions about the factors that promote or hinder social development in infrastructure planning.

The case study enabled a detailed analysis of both the specific conditions in the projects and the broader societal impacts they may have had. However, it is important to note that the results from the case studies were not directly generalizable to all projects, as they were strongly dependent on the specific context. Instead, they provided valuable insights and guidance on how similar projects could be structured and implemented to promote social sustainability and development in the future.

4.2. Data Gathering

The data gathering for this study utilized multiple methods to ensure a comprehensive and in-depth understanding of the research topic. The primary methods included literature research, document analysis, and interviews with key stakeholders.

4.2.1. Project-specific Documents

To gain a basic understanding of the subject and to familiarize ourselves with the specific case contexts ahead of the interviews, a broad range of preliminary material was reviewed. General literature that provided background for the case study was collected through municipal websites, Trafikverket, and the Swedish Government's official portal. In addition, open web searches, primarily using Google, were conducted to explore news articles, local reports, and other relevant documents. This exploratory phase allowed us to form an initial overview of the projects and identify key actors and contextual factors, which helped shape the subsequent interview design and focus.

For case-specific data collection an online search was conducted for the Ängelholm-Maria project, where a comprehensive collection of project specific documents could be found at Trafikverkets website. For the Gothenburg-Trollhättan case, finding

documents online was a challenge because of the age of the project. Therefore, an excursion to the archive of Trafikverket in Mölndal was done. Ahead of the visit to the archive and archivist had prepared related documents for us to start our search. These documents included everything from project specific documents such as environmental impact assessments, railway plans, to land acquisitions as a part of imminent domain and evaluations, mails and bills of sale regarding these acquisitions. The sheer amount of raw data available made the selection process difficult, and therefore documents were scoured for social sustainability and decision-making keywords and read through more thoroughly if they contained these. After an initial search more documents were retrieved from the archive. However, due to disorder of the archive a complete search could not be performed. For complementary materials for the Gothenburg-Trollhättan project the "Wayback Machine", an internet archive webpage, was used to retrieve archived newspapers and documents from contemporary sources.

All general and case-specific documents used in the case study are listed in two different tables below: Table 4 for the Gothenburg-Trollhättan project and Table 5 for the Ängelholm-Maria project. The documents are categorized as follows:

- **Investigation Documents**: This category includes reports, studies, and assessments that were specifically conducted for the projects, including those produced by Trafikverket, Banverket, or other relevant entities. These documents provide direct information about the planning, design, and execution of the railway expansions.

- **General Documents**: This category includes broader documents and datasets from various official sources, such as municipalities, statistics agencies, and other governmental organizations. These documents provide essential contextual information that informs the overall framework of the projects but are not specific to a single case.

Table 4: Göteborg-Trollhättan Case Study References. This table presents the documents specifically related to the Gothenburg-Trollhättan railway expansion project. The sources listed here include reports, studies, and assessments directly associated with the planning, design, and execution of the project.

Category	Source
Investigation Document	A socio-economic comparison of different alternatives for the Oslo–Gothenburg railway. [Banverket et al. (1990). Oslo-Göteborg Nordlänken: Samhällsekonomisk jämförelse av olika alternativ för järnvägen Oslo–Göteborg. VBB Trafik.]
Investigation Document	Localization plan, PM4 Information Exhibition: Road 45 and NORWAY/VÄNER RAILWAY GOTHENBURG–TROLLHÄTTAN. [Vägverket & Banverket (1995). Lokaliseringsplan, PM4 Informationsutställningen: Väg 45 och NORGE/VÄNERBANAN GÖTEBORG-TROLLHÄTTAN]
Investigation Document	Environmental Impact Assessment for the Railway Plan: Nordlänken, Präsebo–Torbacken Section. [Vägverket & Banverket (1997). Miljökonsekvensbeskrivning till järnvägsplan: Nordlänken, delen Präsebo–Torbacken.]
Investigation Document	Environmental Impact Assessment for the Railway Plan: Nordlänken, Torbacken–Hede Section. [Vägverket & Banverket (1998). Miljökonsekvensbeskrivning till järnvägsplan: Nordlänken, delen Torbacken–Hede.]
Investigation Document	Decision on the Choice of Expansion Alternative, Road and Railway Study for ROAD 45 Section Lärje–Älvängen and NORWAY/VÄNER RAILWAY Section Lärje–Alvhem–Hede. [Vägverket & Banverket (2002). Beslut om val av utbyggnadsalternativ, väg- och järnvägsutredning för VÄG 45

	delen Lärje-Älvängen och NORGE/VÄNERBANAN delen Lärje-Alvhem-Hede.]
Investigation Document	Road 45 - Norway/Väner Railway. Work and Railway Plan and Detailed Plans, Angeredsbron – Älvängen, Environmental Impact Assessment. [Vägverket & Banverket (2005). Väg 45 - Norge/Vänerbanan Arbets- och Järnvägsplan samt detaljplaner, Angeredsbron - Älvängen, Miljökonsekvensbeskrivning.]
Investigation Document	About BanaVäg i Väst. [Trafikverket (2007). Om BanaVäg i Väst. Trafikverket.]
Investigation Document	BanaVäg i Väst on the Final Stretch. Newspaper. [Ekholm, T. (2012). BanaVäg i Väst på uppploppet. JARNVAGSnyheter.]
Investigation Document	Norway/Väner Railway. [Trafikverket (2023). Norge/Vänerbanan. Trafikverket.]
General Document	Swedish Association of Local Authorities and Regions [SALAR]. Classification of Swedish Municipalities. [Sveriges Kommuner och Regioner [SALAR] (2024). Klassificering av svenska kommuner. SKR.]
General Document	Statistics Sweden [SCB]. Population by Region and Year (BE0101N1) [Dataset] [Statistikmyndigheten [SCB] (2024). Folkmängd efter region och år (BE0101N1) [Dataset]. SCB.]

Table 5: Ängelholm-Maria Case Study References. This table presents the documents specifically related to the Ängelholm-Maria railway expansion project. The sources listed here include reports, studies, and assessments directly associated with the planning, design, and execution of the project.

Category	Source
Investigation Document	Effects and Socio-Economic Assessment for the West Coast Line, Ängelholm – Maria Section. [Banverket (2007). Effekter och samhällsekonomisk bedömning för Västkustbanan, sträckan Ängelholm - Maria. Banverket.]
Investigation Document	Social Impact Assessment: Railway Investigation for Double Track on the West Coast Line, Ängelholm–Maria Section. [Tyréns AB (2007). Socialkonsekvensbeskrivning: Railway investigation for double track on the West Coast Line, section Ängelholm–Maria. Banverket.]
Investigation Document	Planning Description: Double Track Ängelholm–Maria. [Trafikverket (2018a). Planläggningsbeskrivning: Dubbelspår Ängelholm–Maria. Trafikverket.]
Investigation Document	Plan Description: Double Track Ängelholm–Maria. [Trafikverket (2018b). Planbeskrivning: Dubbelspår Ängelholm–Maria. Trafikverket.]
Investigation Document	Sustainability Report 2021, West Coast Line, Ängelholm – Maria, double track expansion [Hållbarhetsrapport 2021 Västkustbanan, Ängelholm – Maria, dubbelspårsutbyggnad]
General Document	Swedish Association of Local Authorities and Regions [SALAR]. Classification of Swedish Municipalities. [Sveriges kommuner och regioner [SALAR] (2023). Klassificering av svenska kommuner. SKR9.

4.2.2. Interviews

As a complement to the literature study and in accordance with the case studies, interviews were conducted with individuals from the infrastructure sector, which could mainly be categorized into three areas:

- **Employees within Trafikverket's Planning division**

  This group works in the early stages of infrastructure development and is responsible for the long-term planning of the transport system. Their work includes developing strategies, coordinating with municipalities and regions, and conducting early-stage assessments of different alternatives and their potential impacts. The Planning division also serves as a key interface between the Trafikverket and external stakeholders such as municipalities, businesses, and the general public, and lays the foundation for future investments.

- **Employees within the Investment and Major Projects divisions of the Trafikverket**

  These professionals are involved in the implementation of large-scale infrastructure upgrades and new investments. Their responsibilities include procurement, budgeting, coordination of contractors, and monitoring project execution. The Investment division manages projects with budgets up to SEK 1 billion, while the Major Projects division oversees the largest projects exceeding this threshold. These employees work during the execution phase and collaborate closely with both internal teams and external actors.

- **Consultants and contractors involved in the projects**

  The third group consists of actors involved in the projects either as technical consultants or as contractors. Their work includes, for example, design and engineering, technical solutions, environmental assessments, project management, or the actual construction and civil works. These actors contribute expertise and resources and also play a role in how the project goals are realized in practice.

The interview study was conducted in two rounds, the first round of interviews was conducted during weeks 9–10, and the second round during weeks 11–12. In the first round, criterion sampling was applied, meaning participants were selected based on their relevant and informative experience to gain a deep understanding of the research question (Patton, 2002). To ensure insights from those directly involved, participants were chosen from both case projects. The authors received support from the company supervisor to identify and contact stakeholders within the relevant categories. Additionally, to gain a broader and more long-term perspective, industry professionals working with sustainability were contacted to reflect on how the importance of social sustainability may have changed over time.

Snowball sampling was also used in parallel, where initial participants recommended other relevant individuals within the target group. This approach allowed the sample to grow gradually, ensuring a wider range of perspectives and a more comprehensive understanding of the topic (Patton, 2002). In the second round, interviews were conducted with individuals identified through snowball sampling. The aim was to clarify and deepen specific areas of interest, ensuring the inclusion of both central actors and those who could offer complementary perspectives.

Table 6 provides an overview of all respondents, including details such as company, role, connection to case project, duration of the interview, meeting format, and interview date. Physical interviews were conducted at the companies' offices, while digital interviews were held via Microsoft Teams.

Table 6. Presentation of interviewees

Company	Role	Connection to case project	Time (min)	Meeting form	Interview date
Trafikverket Investment Division	Project Manager	Gothenburg - Trollhättan	50	Physical, two persons	26/2-2025
Trafikverket Investment Division	Communications Manager	Gothenburg - Trollhättan	50	Physical, two persons	26/2-2025
Crabat Consultant	Environmental Consultant	Ängelholm - Maria	40	Microsoft teams	27/2-2025
Skanska Contractor	Project Manager	Ängelholm - Maria	34	Microsoft teams	5/3-2025
Trafikverket Planning Division	Strategic Planner	Ängelholm - Maria	30	Microsoft teams	11/3-2025
Trafikverket Planning	Senior Investigation	No connection	45	Microsoft teams	18/3-2025

Division	Manager Social Sustainability	to specific project			
Trafikverket Investment Division	Program Coordinator Planning and Social Perspectives	No connection to specific project	59	Microsoft teams, two persons	20/3-2025
Trafikverket Investment Division	Specialist Landscape Architect	No connection to specific project	59	Microsoft teams, two persons	20/3-2025

The interviews were conducted semi-structured which means that the questions were asked in a consistent order, though minor deviations occurred when deemed necessary. Two of the interviews were conducted as group interviews (1a and 1b) and (6a and 6b), while the remaining participants were interviewed individually. The interviews were conducted in Swedish, as it was the first language of all participants. This created a comfortable and open environment, facilitating effective communication and allowing respondents to express their thoughts and experiences more freely, resulting in richer and more nuanced responses.

Both authors participated in all interviews to ensure continuity and shared understanding of the material. However, the roles during the interviews were divided for practical and analytical purposes. One author took the lead in posing the interview questions, maintaining the flow of the conversation and ensuring that all key themes were covered. The other author adopted a more analytical role, focusing on taking detailed notes and identifying relevant follow-up questions based on the interviewee's responses. This division of responsibility allowed for both structure and flexibility during the interviews and supported a more nuanced interpretation of the collected material. The interview template can be found in Appendix 1.

After the interviews, email contact was maintained with some of the respondents to follow up on specific references or to request links to reports mentioned during the conversations. These exchanges were limited in scope and did not result in any further substantive input beyond the clarification or sharing of documents.

In order to obtain a broad and balanced understanding of the projects, attempts were made to include the perspectives of the affected municipalities. Despite repeated efforts and follow-up reminders, several municipalities did not respond. The City of Gothenburg eventually replied via email but declined to participate in an interview,

stating that they were not responsible for the follow-up of the railway expansion between Gothenburg and Trollhättan and therefore had no knowledge of how the project had impacted the city. The absence of municipal involvement in follow-up is noteworthy, particularly in relation to the study's focus on social sustainability and the distribution of responsibility within infrastructure projects.

A recurring theme in the interviews was the absence of structured post-project evaluation regarding how the studied railway expansions had affected different towns or cities from a social perspective. None of the interviewees mentioned any formal assessments having been conducted after project completion to evaluate long-term social impacts. It also remained unclear whether such responsibility should fall on Trafikverket or the municipalities. As a result, discussions about long-term outcomes largely relied on general statistical indicators, such as those from Statistics Sweden (SCB), and on respondents' individual reflections. Particularly in the case of the Gothenburg–Trollhättan project, some concrete examples were given, but these were based on personal impressions rather than comprehensive evaluations. For the more recently completed Ängelholm–Maria project, long-term effects had not yet taken shape at the time of the study. Overall, reasoning about future societal outcomes remained hypothetical and should be regarded as relatively weak in evidential terms. This limitation has been taken into account in the interpretation of interview data related to social impacts over time.

4.3. Data Handling

This chapter describes the methods used to handle and process the data collected throughout the study. It covers the management of both documents and interview data, ensuring accuracy, confidentiality, and compliance with data protection regulations. The chapter also explains how the interview transcriptions were categorized, analyzed, and translated for clarity and accuracy, ensuring the data was well-organized for the subsequent analysis.

4.3.1. Document Handling

At the beginning of the research, the literature review focused on covering the theoretical foundations of social sustainability, decision-making in infrastructure projects, and related topics. This provided a basis for understanding key issues and concepts, such as social sustainability, social impact, decision-making in infrastructure, etc., which would form the foundation for the empirical analysis. Throughout the course of the work, and as interviews were conducted and results emerged, the literature review dynamically evolved and was supplemented with relevant documents and materials identified as important through the interviews. At the same time, parts of the original text that proved to be redundant, incorrect, or made the topic too broad were removed to focus more on the relevant aspects within the scope of the work.

As the interview results began to provide new insights, it became clear that several documents, laws, and policies not originally included in the literature review were of great importance for understanding how social sustainability and decision-making are addressed in practice. These documents have been included to provide a more nuanced and practically grounded understanding of the subject. By integrating these supplementary sources, the literature review has become more relevant and contextualized, making it easier for the reader to understand the connections between theory and practice.

The supervisor at Chalmers has played an important role in guiding the work and ensuring that this dynamic process of complementing and updating the literature review has been methodologically sound. Her feedback has been valuable in creating a clear structure and ensuring that the literature review and the results chapter complement each other in a way that strengthens the relevance and quality of the research.

Source management in the thesis has been done according to APA 7. Physical documents have been stored at Crabat for ease of access to the authors, all these documents were of public origin and therefore no excessive security measures needed to be taken. Scientific articles and other papers retrieved online were saved locally on the authors computers and deleted after the thesis was completed.

4.3.2. Ethics and Sustainability

Before each interview, a GDPR-compliant consent form was sent to the participants that they were asked to sign. The form described how personal data would be collected, processed, and deleted. It stated that the participants' name, professional role, and employer could be collected for documentation purposes, and that audio recordings would be made during the interviews. All interview data was stored on a locked folder between the two authors' computers and deleted after the thesis was completed in line with the GDPR-compliance forms description. All data was handled in accordance with Chalmers University of Technology's guidelines for personal data processing. Consent was voluntary and could be withdrawn at any time. Information about Chalmers' responsibilities as data controller and data protection policy was included in the consent form.

Personal data was anonymized during transcription, meaning that only the respondent's role and their connection to the project are presented in the study (e.g., "Project Manager, Trafikverket").

In addition to ethical considerations regarding data collection and stakeholder integrity, this thesis also reflects on its contribution to sustainable development. By focusing on social sustainability in railway infrastructure, the study supports the principles of

inclusivity, equity, and long-term societal well-being. The research contributes to SDG 11 (United Nations, n.d.-b), SDG 9 (United Nations, n.d.-a), and SDG 16 (United Nations, n.d.-c.) by addressing how decision-making and participation processes can be strengthened to better integrate social aspects in infrastructure projects. Through its qualitative and participatory approach, the thesis seeks to amplify underrepresented perspectives and encourage more socially responsible planning practices.

4.3.3. Processing of the Interviews

For interviews conducted face to face, audio was recorded using personal mobile phones. These recordings were later transcribed using the transcription tool in Microsoft Teams, by starting a Teams meeting and playing back the recording. For online interviews, Microsoft Teams was used both for conducting the interviews and for recording them via the platform's built-in recording function. The audio from these sessions was transcribed using Microsoft Teams' automatic transcription tool. All transcripts were carefully reviewed and checked by both authors, ensuring accuracy and eliminating potential errors. The transcription was stored in the authors' private Google Drive folder, with no access granted to third parties. Upon completion of the thesis, all collected data was deleted.

During the transcription of the interviews, the material was color-coded to facilitate later analysis. Questions were marked in blue, any mention of new contacts or materials was highlighted in orange, significant quotes were marked in pink, examples given were highlighted in green, and other relevant information was marked in yellow. This color-coding method proved to be very helpful for several reasons. The thoroughly executed transcription made it easier to write the results section by providing clear and organized material from the interviews. Additionally, the categorization facilitated the comparison of responses to the same questions, making it easier to see where the respondents' answers differed and where they agreed. This method also helped identify key themes and insights, which were beneficial for interpreting the results in relation to the research questions.

All transcriptions were conducted in Swedish, and the material in the work was subsequently translated by the authors into English. A potential disadvantage of this method was that the translation into English added an extra step to the process, which risked losing some subtle nuances or cultural meanings in the translation. Certain expressions or formulations that were clear and appropriate in Swedish might have been difficult to translate exactly into English, which carried the risk of losing these nuances. However, the authors considered this a manageable issue and believed that the translation did not significantly impact the analysis and interpretation. To minimize issues related to translation, key words and phrases were carefully reviewed for

synonyms and thoroughly discussed by both authors to ensure accurate meaning and deliberate word choice.

4.4. Analysis Strategy

The analysis in this thesis was conducted in three interlinked parts: document analysis, a thematic analysis of interviews, and a comparative discussion that brought these empirical insights into dialogue with the theoretical framework.

4.4.1. Empirical Analysis

The literature review provided the conceptual and thematic foundation for the study by identifying key areas such as social sustainability, its dimensions, decision-making models, and the structure of infrastructure planning in Sweden. These themes also informed the subsequent empirical analysis. A comparative review of case-specific documents for the Ängelholm–Maria and Gothenburg–Trollhättan railway projects was conducted to examine how social sustainability considerations were addressed in each case. To ensure a consistent and objective comparison, documents were examined for the presence and treatment of relevant concepts, such as consultation processes, social impact assessments, accessibility, and local stakeholder involvement. The findings from these documents were then mapped onto the categories derived from SIA, allowing for a structured evaluation of how social aspects were considered in each project.

4.4.2. Interview Analysis

The interview analysis was closely integrated with the transcription process. A color-coding technique was applied during transcription, where each color represented a thematic area from the literature review and interview guide. This allowed the authors to identify relevant content in real-time and collect key quotes connected to each theme. The thematic structure was abductive, initially based on the theoretical framework and literature review, but evolved during the analysis to include new themes that emerged from the interviews themselves (Bryman & Bell, 2017).

Once transcribed and color-coded, the interview material was analyzed thematically to identify both commonalities and differences across the respondents' perspectives. Particular attention was given to comparing the three predefined categories of interviewees. This comparative approach allowed the authors to explore how perceptions varied across stakeholder roles and to identify patterns in how different groups understood and engaged with the concept of social sustainability. To ensure reliability and reduce individual bias, both authors reviewed and discussed the coding and interpretation of the material. Furthermore, the interview findings were triangulated

with insights from the literature review and case documents to support more nuanced interpretations (Bryman & Bell, 2017).

4.4.3. Strategy for Discussion

The final part of the analysis was conducted in the discussion chapter, where the most significant findings were interpreted in relation to the theoretical framework and research questions. While the results chapter presents the overall empirical findings, the discussion focuses on three central themes that emerged from the interviews and were particularly relevant to the research questions: consultation processes, the role of key actors (champions), and the evolving treatment of social aspects in infrastructure planning.

To guide this analysis, the thesis applied a theoretical framework grounded in SIA, complemented by concepts from participation theory and stakeholder theory. The framework served several purposes. First, it provided an analytical structure for identifying, categorizing, and understanding the social impacts of double-track railway development between medium-sized and larger cities in Sweden. Second, it enabled a deeper analysis of how different stakeholders, such as Trafikverket, municipalities, consultants, and civil society, both influenced and were influenced by decision-making processes. The framework also supported a critical examination of how priorities are shaped during the planning process, particularly regarding the balance between social goals and other factors such as economic efficiency or technical feasibility. By drawing on SIA, the framework aimed to highlight often overlooked aspects of social sustainability, including inclusion, safety, and access to public transportation (Vanclay, 2003). The integration of participation theory emphasized the importance of when and how stakeholders were granted influence, which was essential for understanding the long-term social outcomes of infrastructure-related decisions.

Through this strategy, the analysis sought to create a well-rounded and grounded understanding of how social sustainability is interpreted, implemented, and experienced in double-track railway projects in Sweden. Due to the timeframe of this research, post-project social outcomes could not be fully assessed. Longitudinal studies would be required to determine sustained social effects over time.

5. Results

This chapter presents the results of the study based on two case studies: the double-track expansion between Gothenburg and Trollhättan, and between Ängelholm and Maria. The findings are based on document analysis, interviews with key stakeholders, and complementary statistical data. The chapter is structured in three parts. First, the case-specific findings are presented in section 5.1 to section 5.4, focusing on context, decision-making processes, and perceived social impacts of both cases. This is followed by section 5.5 on Overarching Interview Reflections, which highlights common patterns, differences, and developments over time, particularly in how social sustainability has been addressed in the two projects. Section 5.6 introduces new approaches for social sustainability in infrastructure planning. This part draws on interview data related to more recent projects and illustrates how the work with social sustainability has evolved, including emerging methods, perspectives, and organizational changes within Trafikverket's planning processes.

5.1. Case: Gothenburg - Trollhättan

What? The railway between Gothenburg Central and Trollhättan Station was upgraded to a double track. The section between Gothenburg and Älvängen was included in the BanaVäg i Väst project, which also involved the development of the E45 highway.	***Current status*** The project was built between 2004 and 2012 and is fully operational.
Why? The project aimed to improve regional connectivity, reduce travel times, and enhance capacity for both passenger and freight transport.	***Cost*** The total cost of the project was approximately 12 billion SEK, covering both the railway upgrade and the expansion of the E45 highway.

5.1.1. Introduction to the Case

The double track construction between Gothenburg and Trollhättan was part of the Norge/Vänerbanan, which was one of the major trunk railways in the Swedish railway system (Trafikverket, 2023). As early as 2002, the Norway/Vänerbanan railway played a significant role in transportation between Gothenburg and Trollhättan, with continued connections to the Karlstad region and even Oslo (Vägverket & Banverket, 2002). At the time, the single-track railway was expected to soon reach its capacity limit, and there was potential to triple train traffic along the Gothenburg–Trollhättan corridor.

At the time, the double track extended all the way from Gothenburg to Öxnered, close to Trollhättan, as shown in Figure 3, enabling more efficient traffic for both passengers and freight (Trafikverket, 2023). The project contributed to a modern and high-capacity infrastructure that was crucial for the development of the region.

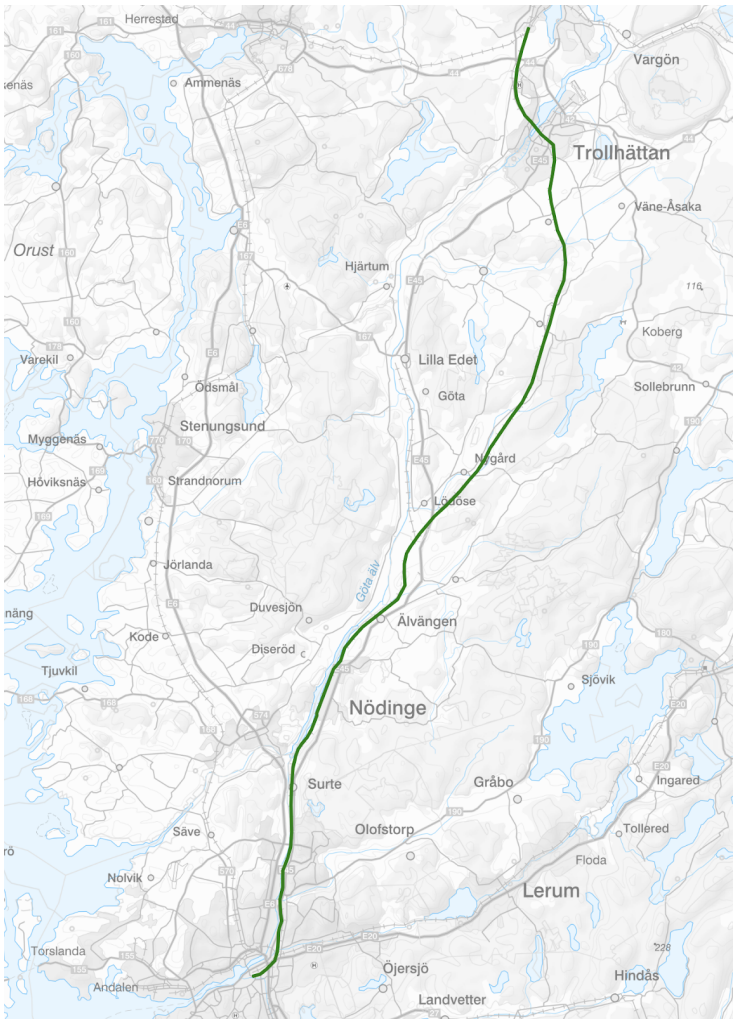

Figure 3. Map created using the Swedish mapping service Min Karta (Lantmäteriet, n.d.), highlighting the Gothenburg–Trollhättan railway.

The expansion from single-track to double-track between Gothenburg and Trollhättan was carried out in part as the independent project *BanaVäg i Väst*, which ran from 2004 to 2012 (Trafikverket, 2007). The project was a collaboration between Banverket and Vägverket and included a total of 16 sub-projects with a total cost of around 12 billion SEK, where different contract types were used depending on the nature of each sub-project and its contractor (Ekholm, 2012; Trafikverket, 2007). The railway and the E45 followed the same route from Gothenburg to Älvängen, and the two authorities worked side by side with a shared budget, joint personnel, and coordinated project offices. The joint budget was estimated to have reached approximately 4 billion SEK. After Älvängen, they diverged, and the railway section toward Trollhättan was subsequently developed as a separate project.

The cities affected by the Gothenburg–Trollhättan project were as follows: Gothenburg, Surte, Bohus, Nödinge, Nol, Alafors, Älvängen, Alvhem, Skepplanda, Lödöse (Lödöse södra), Nygård, and Trollhättan. Gothenburg was classified as an A1 municipality according to SALAR (2023). Surte, Bohus, Nödinge, Nol, Alafors, Älvängen, and Skepplanda were part of Ale municipality, which was classified as an A2 municipality with 31,900 inhabitants. Of these, 70% commuted, with 48% commuting specifically to Gothenburg (SALAR, 2023). Lödöse and Nygård belonged to the Lilla Edet municipality, which had 14,300 inhabitants and was also an A2 municipality. In Lilla Edet, 65% of the working population commuted, with 27% commuting to Gothenburg specifically. Trollhättan was an independent municipality, classified as a B3 municipality, with 59,200 inhabitants, of which 50,400 lived in Trollhättan city.

5.1.2. Framing and Prioritization of Social Impacts

Against this backdrop of regional commuting and population growth, the BanaVäg i Väst project was initiated to respond to mounting infrastructure demands. The purpose of the project was to address the expansion needs of both the E45 highway and the Norway/Vänerbanan railway between Gothenburg and Trollhättan. The project aimed to enhance the infrastructure to meet the increasing demands for both freight and passenger traffic (Trafikverket, 2007). Specifically, the expansion was necessary due to the insufficient standard of E45 in several sections and the growing need for improved railway capacity, as the current single-track, winding railway had reached its capacity limits.

In 1990, Banverket, NSB, and SJ, which are a predecessor to Trafikverket, Norway's counterpart to Trafikverket and the primary train operator in Sweden, conducted a socioeconomic assessment comparing different railway expansion alternatives between Oslo and Gothenburg (Banverket et al., 1990). The assessment analyzed both economic feasibility and broader regional effects. The study compared multiple alternatives, evaluating their net economic impact, travel time reductions, and regional development potential.

The results indicate that while some alternatives showed higher net revenue potential than others, none of them were strictly economically profitable when considering investment costs, which ranged between 8 and 12 billion SEK (Banverket et al., 1990). However, the assessment emphasized that the project carried substantial benefits beyond direct economic profitability. These included increased railway capacity, improved regional accessibility, and enhanced labor market integration between Norway and Sweden. The socioeconomic assessment report also highlighted that Northern Bohuslän, due to its higher population density and economic activity, would benefit more from an improved railway connection compared to other regions such as Dalsland, a less populated region of Sweden. This indicates that social aspects were

taken into consideration, rather than just economic or ecological factors, exemplified by the regional development potential, labor market growth and population changes.

Furthermore, the report acknowledged that a phased construction approach would be necessary, given the high investment costs and long implementation timeline of 7–15 years (Banverket et al., 1990). The analysis also considered the social impact of railway expansions versus potential route closures, noting that reductions in railway service would negatively affect more people in Bohuslän than in other regions. Despite economic challenges, the project was seen as a key step toward strengthening cross-border transport, fostering regional development, and improving sustainability in long-distance travel.

In the early stages of the project timeline, several alternatives were considered for the route between Gothenburg–Trollhättan, which gives an indication of the prioritizations being made in the project. The preliminary study for the project determined that the zero alternative, which involved minor improvement measures until 2010, was not an acceptable option. The study concluded that an upgrade of the railway was not meaningful and that double-tracks were a prerequisite for the investment in increased train transport on the route.

For example, the localization studies for the Lärje–Älvängen section led to four main alternative placements, designated as alternatives 1–4 (Vägverket & Banverket, 2002). Alternative 1 involved keeping the road and railway in the river valley. Alternative 2 involved building the road in an eastern location while maintaining the railway in the river valley. Alternative 3 meant keeping the road in the river valley and placing the railway in a tunnel between Lärje and Bohus, as well as in an eastern ground-level location north of Bohus. Alternative 4 involved keeping the road in the river valley south of Bohus and in an eastern alignment north of Bohus, placing the railway in a tunnel between Lärje and Bohus, and keeping it in the river valley north of Bohus. For the continuation of the project, alternative 1 was chosen in accordance with consultations with the public and economic feasibility, see figure 4, which in 2002 became the basis for further planning and what has later been built.

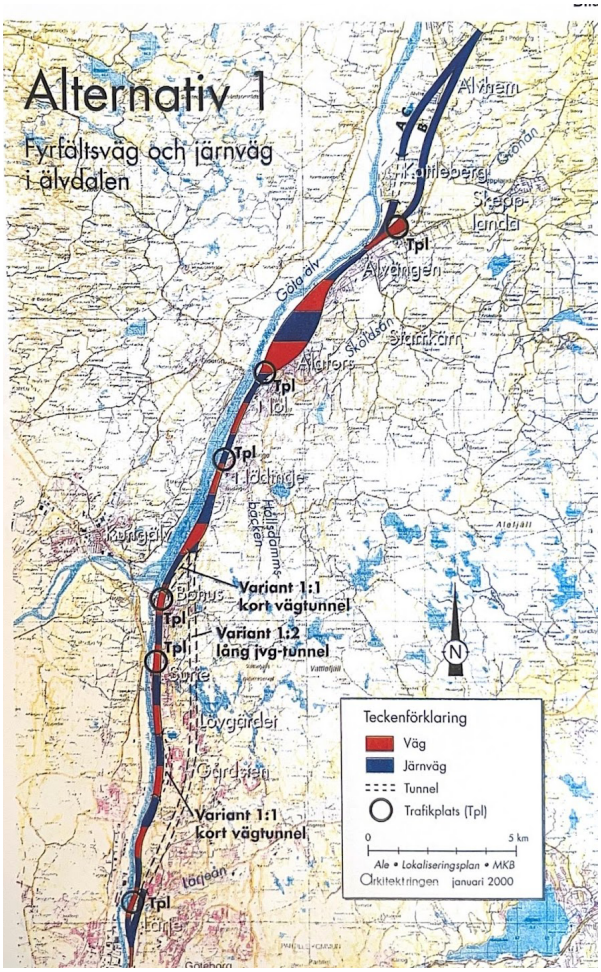

Figure 4. Alternative 1 from the report Beslut om val av utbyggnadsalternativ (Vägverket & Banverket, 2002)

Information on which alternatives were considered for the rest of the railway, Älvängen – Trollhättan section, is missing from the archives of Trafikverket. Despite repeated inquiries, relevant documents have not been found.

According to the Project Manager and Communications Manager from Trafikverket, the term 'social sustainability' was not used as systematically as it is today when the Gothenburg–Trollhättan project was being developed and built. The Project Manager at Trafikverket said:

> *"Now there is a different process for defining social sustainability in projects, there wasn't one back then."*
>
> - *Project Manager at Trafikverket*

However, some social issues were still discussed to varying extents. An important aspect of the project's implementation was the collaboration with Ale Municipality, which stands out as a strong example of how early and structured cooperation between Trafikverket and local municipalities can lead to better transport solutions, according to the Project Manager at Trafikverket. In Ale, discussions were held early on about

how the railway expansion could be integrated with local infrastructure to maximize accessibility and safety for residents. The Communications Manager from Trafikverket stressed the importance of such collaborations:

> *"We don't have the local knowledge, the municipality knows its own city best and knows how people move around there.* It is important to have a continuous dialogue."
>
> - *Communications Manager at Trafikverket*

This collaboration resulted in new stations and improved connectivity, strengthening the area's development, which was also reflected in rising housing prices and increased migration to the region according to representatives from Trafikverket. Trafikverket has emphasized that close dialogue with municipalities is essential to ensuring that railway investments achieve their full potential.

> *"We can build a first-class facility, but if no one wants to go there or if travelers have difficulty getting to the station, it doesn't matter how good it is."*
>
> - *Project Manager at Trafikverket*

While this highlights the importance of local engagement and consideration of social context, it also raises the question of how these aspects were addressed, or overlooked, in the project's formal planning process.

5.1.3. Stakeholder Influence and Participation

In the Gothenburg–Trollhättan project, no SIA was conducted, possibly due to the age of the project. According to the Project Manager at Trafikverket, there was not even a process for defining social sustainability in projects at that time. However, the project showed in several minor ways that the inhabitants' needs were taken into account. For instance, the report *Beslut om val av utbyggnadsalternativ* (Vägverket & Banverket, 2002) provides insight into the decision-making process regarding the route between Lärje and Älvängen were various road and railway corridor alternatives were evaluated based on technical studies, consultation feedback, and discussions with relevant authorities. The final decision prioritized certain social impacts, indicating that such considerations influenced the outcome to some extent.

PM4 Informationsutställningen (Vägverket & Banverket, 1995) presents the results of a public survey along with input from fourteen different companies and organizations in the potentially affected areas. Out of 243 responses, 210 supported the first alternative. This was also the alternative that was eventually chosen. Most of the companies and organizations were in favor of this option and expressed skepticism

toward the other alternatives. Some organizations questioned the need for new construction, but did not provide clear arguments to support their concerns. Overall, a large portion of the population appeared most satisfied with alternative 1. In particular, a significant number of residents in Alvhem requested that the railway be routed on the east side of the community. This was also how it was eventually built. This may suggest that the voices of the residents were heard and taken into account in the decision-making process. However, the choice of alternative 1 could also reflect the view of the project planners, who may have considered it the most technically or economically suitable option. In the motivation for their choice Trafikverket stated that the decision had been made because it is the most advantageous due to its lower investment costs, efficient land use, potential for connecting towns along the corridor to a future commuter train system instead of passing them by, and improved societal benefits and traffic safety (Vägverket & Banverket, 2002).

Consultation influenced elements of the project design, particularly regarding station placements and mitigation measures. Despite these efforts, the limited attention given to broader social sustainability considerations highlighted a gap in the planning. Reflecting on the overall role of consultation and stakeholder engagement in the Gothenburg–Trollhättan expansion, the Project Manager at Trafikverket said:

> *"I believe that many of the social aspects in the BanaVäg i Väst project probably emerged through the public consultations. Identifying the social aspects likely made those consultations with the public even more important in the past, since we then lacked a structured process for working with social sustainability."*
>
> - *Project Manager at Trafikverket*

In the project, the Project Manager and Communications Manager from Trafikverket shared a concrete example of when consultation influenced a decision. In a small town along the railway, there was a debate about whether a local road should pass under or over the tracks. An overpass was ultimately chosen due to safety concerns raised during the consultation process. They explained that many women, in particular, expressed that a tunnel felt unsafe, which contributed to the decision to build an overpass instead.

Using Arnstein's Ladder of Citizen Participation as a framework, the Gothenburg–Trollhättan expansion project can be positioned somewhere between partnership and placation. Citizens expressed their concerns during structured consultation meetings, and while their suggestions were not directly implemented, they were acknowledged and seemingly considered in the decision-making process. This suggests a degree of shared influence, where citizens were involved in discussions with powerholders and participated at certain stages of the planning process. Since the final decision remained with the authorities, the level of power shared was limited. The project therefore reflects

a participation level where dialogue occurred, but negotiation and equal decision-making power were not fully achieved.

5.1.4. Trade-offs

This limited empowerment of citizens is also reflected in the project's formal evaluations, where social dimensions received comparatively little analytical attention. The environmental impact assessment (EIA) for the Gothenburg–Trollhättan double-track expansion was conducted as part of the broader BanaVäg i Väst project and is documented in *Väg 45 - Norge/Vänerbanan Arbets- och Järnvägsplan samt detaljplaner, Angeredsbron - Älvängen, Miljökonsekvensbeskrivning* (Vägverket & Banverket, 2005). The assessment largely centers on environmental and technical impacts, such as land use changes, landscape alterations, and transport infrastructure development. Although it touches on accessibility and community connectivity, these social aspects are addressed superficially and are not given analytical depth.

This prioritization of environmental and technical considerations reflects a pattern seen in earlier EIAs for related sections of Nordlänken, including Präsebo–Torbacken and Torbacken–Hede (Vägverket & Banverket, 1997; Vägverket & Banverket, 1998). In these reports, social impacts, such as urban integration, changes to mobility patterns, and the long-term well-being of local communities, were similarly underexplored. While issues like noise and vibration were acknowledged, the mitigation measures suggested (e.g., noise barriers, facade insulation) were largely reactive and failed to engage with the broader societal consequences of infrastructure expansion.

From a SIA perspective, this points to a narrow conceptualization of "impact," where the technical and environmental domains are prioritized over the social. The EIA for Gothenburg – Trollhättan did consider the barrier effects of the railway and the need for functional integration of new infrastructure within urban environments. However, these were treated as secondary concerns, rather than as central components of sustainable development. This aligns with insights from the interview with Trafikverket, where it was noted that social sustainability often lacks a clear framework and tends to be deprioritized in early planning phases.

The trade-offs observed in the Gothenburg–Trollhättan case thus reflect an institutional bias toward measurable, technical factors over qualitative, long-term social outcomes. This imbalance limits the potential for infrastructure projects to fully support socially sustainable development. SIA theory emphasizes the importance of stakeholder involvement, long-term social well-being, and equitable decision-making, elements that were only partially addressed in the project's planning. The case highlights the need for future assessments to incorporate more holistic social evaluations, including how infrastructure affects everyday life, social cohesion, and mobility in affected

communities (Vägverket & Banverket, 1997; Vägverket & Banverket, 1998; Vägverket & Banverket, 2005).

5.1.5. Long-term Outcomes

In parallel with these planning considerations, demographic changes in the affected municipalities provided important context for evaluating the project's long-term social impact. Before the double-track expansion began in the early 2000s, the municipalities were all noticeably smaller, although they remained within the same categories according to SALAR's framework (Sveriges kommuner och regioner [SALAR], 2024). Between 1999 and 2023, the population grew by approximately 28% in Ale, 12% in Lilla Edet , 12% in Trollhättan, and 31% in Gothenburg, see table 7 for exact numbers (Statistikmyndigheten [SCB], 2024). This pattern of growth indicates that the affected municipalities, particularly Ale and Gothenburg, expanded at a faster rate than the national average of around 19%, which may reflect their increasing attractiveness and improved accessibility over time.

Table 7. population size 1999 and 2023 for Ale, Lilla Edet, Gothenburg, and Trollhättan, and population growth in the municipalities and the national average (SCB, 2024)

	Ale	**Gothenburg**	**Trollhättan**	**Lilla Edet**	**National Average**
Population 1999	25 329	462 470	52 879	12 917	
Population 2023	32 446	604 616	59 073	14 426	
Growth	~28%	~31%	~12%	~12%	~19%

According to both the Communications Manager and the Project Manager at Trafikverket, the standard model for socioeconomic analysis did not fully reflect the long-term benefits of the BanaVäg i Väst project, an issue they described as a recurring challenge in railway planning more broadly. They highlighted that travel patterns and regional development quickly surpassed the expectations set before the expansion. Shortly after the project's completion, rail travel increased sharply, far exceeding initial forecasts.

Beyond increased commuting, the expansion also contributed to rising property values and boosted local economies in the affected municipalities. The surge in demand revealed a previously unmet need for improved public transport in the region and illustrated how access to faster, more frequent trains could significantly influence commuting habits and regional mobility.

According to the Project Manager and Communications Manager from Trafikverket the improved railway connections, especially to towns like Lödöse and Lilla Edet, had a notable impact on the housing market, with significant price increases following the expansion. These towns became more attractive to commuters, as the enhanced accessibility allowed more people to live outside of Gothenburg while still maintaining a convenient daily connection to the city.

> *"This applies regardless of where in the country we build, the ability to travel and study in other locations creates new opportunities for people."*
>
> - *Project Manager at Trafikverket*

The decision to move forward with the BanaVäg i Väst project clearly illustrates how large-scale infrastructure investments often rely on political will and strategic foresight that extend beyond what traditional socioeconomic models can quantify.

5.2. Case: Ängelholm - Maria

What?	***Current Status***
The railway between Ängelholm Station and Maria Station in northern Helsingborg is being upgraded to a double track. The stations in Ängelholm, Kattarp, Ödåkra, and Maria are being renovated.	Construction began in August 2020. The double track opened for traffic in December 2023. The entire project was completed in 2024.
Why?	***Cost***
Increased capacity on the route and fewer disruptions. Improved opportunities for travel, housing, study, and work in southwestern Sweden, as well as better connections to Oslo and Copenhagen.	2.4 billion SEK. The project is co-financed by Region Skåne and the City of Helsingborg

5.2.1. Introduction to the Case

The Ängelholm–Maria section was part of the Västkustbanan, a key trunk railway in Sweden that ran between Gothenburg and Lund. Västkustbanan served as an essential corridor for both passenger and freight transport, linking the metropolitan regions of Oslo/Gothenburg with Malmö/Copenhagen (Trafikverket, 2018a). Upgrading the Ängelholm–Maria section to a double track had been necessary due to high congestion and limited capacity, which had constrained the potential for further railway development. The project aimed to enhance transport quality, improve punctuality,

support longer commuting distances, and strengthen the coordination between urban development and the transport system (Trafikverket, 2018b). Its overarching goal had been to meet the target standard for Västkustbanan, including double tracks along the entire route and track geometry adapted for high-speed trains at 250 km/h.

The cities directly affected by the project were Ängelholm, Kattarp, Ödåkra, and Mariastaden, the latter being a part of Helsingborg. Kattarp, Ödåkra, and Mariastaden belonged to Helsingborg municipality, which was classified as a B3 municipality according to SALAR (2023). At the time, the municipality had 149,300 inhabitants, of whom 113,800 lived in Helsingborg city. Ängelholm was a separate municipality, classified as B4, with a population of 42,900. Of these, 46% commuted out of the municipality, primarily to Helsingborg, which accounted for 40% of outbound commuting destinations (SALAR, 2023).

The construction of the double track between Ängelholm and Maria was procured as a design-build contract (totalentreprenad), in which Skanska was appointed as the contractor. This form of procurement means that Skanska was responsible for both the planning (design) and execution (construction) of the project (Trafikverket, 2021). The contract was signed in April 2020, and construction began in August the same year. The work included not only the double-track upgrade but also the reconstruction of four stations: Ängelholm, Kattarp, Ödåkra, and Maria. The project was scheduled to continue until 2024, when the new double track would be fully operational across the entire section.

5.2.2. Framing and Prioritization of Social Impacts

The project's goals were to increase capacity and reduce travel times in order to improve commuting opportunities and strengthen regional development (Trafikverket, 2018b). Traffic safety was to be improved by eliminating level crossings, while accessibility for rail passengers would be enhanced through the modernization of stations. At the same time, noise levels were to be limited in accordance with applicable standards, and the design was intended to be adapted to the natural and cultural landscape as well as the urban environment. Through these measures, the towns along the route were expected to become more interconnected, thereby strengthening commuting opportunities, increasing regional attractiveness, and contributing to economic growth (Trafikverket, 2018b).

In the early stages of the project, several route alternatives between Ängelholm and Maria were considered, see figure 5. Investigations conducted in 2007 analyzed four expansion alternatives (UA) for the double-track alignment (Trafikverket, 2018b). UA1 involved upgrading the existing railway, with sub-alternatives focusing on optimizing speed and cost efficiency. UA2 proposed a sunken railway through Ödåkra, either in a

tunnel or an open trench. UA3 suggested a new alignment west of Ödåkra with a relocated station, while UA4 proposed a route via Väla, east of Ödåkra and Kattarp, reconnecting to the existing line at Rögle. After a comprehensive evaluation, UA2 and UA4 were excluded due to high costs and unfavorable station placement in Ödåkra. UA1 and UA3 were selected for further study (Trafikverket, 2018b).

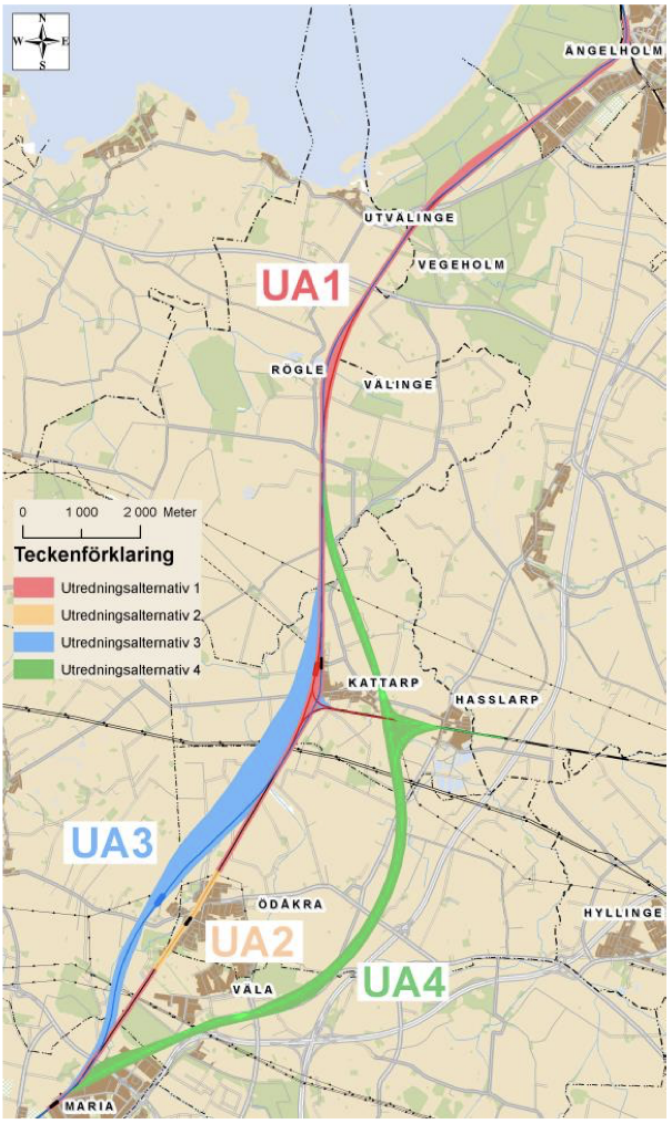

Figure 5. retrieved from Trafikverket (Trafikverket, 2018b) Map of the investigated alternatives for the double-track alignment from the railway study. UA1 and UA3 were further analyzed, while UA2 and UA4 were excluded due to traffic and cost-related consequences.

Alternative UA1 was ultimately selected as it offered a balanced solution in terms of speed, cost, and environmental and social impacts (Trafikverket, 2018b). It allowed for the double-track expansion along the existing railway corridor while improving speed through moderate curve straightening. Compared to the other alternatives, UA1 was considered more feasible due to lower construction costs and reduced disruption to the surrounding community (Trafikverket, 2018b). UA3, the second-best alternative, proposed a new alignment west of Ödåkra with a relocated station. Although this option would have reduced noise and eliminated the existing railway barrier in central Ödåkra,

it was ultimately dismissed (Trafikverket, 2018b). The new station's location outside the town was expected to lead to lower passenger numbers and increased travel distances for residents. Moreover, the substantial changes to Ödåkra's urban structure would have required extensive compensatory measures, making the alternative less favorable overall (Trafikverket, 2018b).

Although the concept of social sustainability was not explicitly mentioned in the project description for the double-track expansion between Ängelholm and Helsingborg (Trafikverket, 2018b), several related aspects were considered in the corridor selection and design. Key objectives included increased traffic safety through the removal of level crossings and improved accessibility via station adaptations benefiting groups such as the elderly, children, and people with reduced mobility. Noise mitigation measures were also proposed to protect residential areas, contributing to health and quality of life. The railway's barrier effect was acknowledged, and efforts were suggested to reduce its impact on local mobility and community cohesion. Additionally, the project aimed to support regional development by increasing capacity and shortening travel times, thereby improving access to labor markets and education. However, the plan lacked a comprehensive analysis of social impacts and a clear method for integrating social values into decision-making. While public consultation was referenced, its influence on corridor selection was not elaborated (Trafikverket, 2018b).

The Environmental Consultant from Crabat and the Project Manager from Skanska explained during the interviews that they had joined the project at the construction stage, and therefore had not been involved in earlier decisions, such as the selection of the railway corridor. The Environmental Consultant emphasized that key issues related to social sustainability were typically addressed during the planning phase, before construction contracts were initiated. This was confirmed by Trafikverket's Strategic Planner, who noted that social aspects had primarily been considered through the comprehensive impact assessments, with a focus on measurable factors such as travel time reductions, traffic safety, gender equality, and public health.

According to the Environmental Consultant, a SIA had been developed during the detailed development planning phase but was not included in the earlier comprehensive planning. The consultant also noted that the SIA had not been produced by Trafikverket's planning department and was neither actively used nor followed up in later stages of the project. This suggested that, although social sustainability was formally addressed at a later stage, it had not been integrated from the outset of the planning process. This view was further supported by the fact that the other two case-specific interviewees were unaware of the SIA's existence.

The aforementioned SIA was conducted by Tyréns AB in 2007 to evaluate how different groups would be affected by the proposed expansion of the Västkustbanan, comparing two alternatives and a zero alternative (Tyréns AB, 2007). The assessment highlighted key social factors such as safety, accessibility, gender equality, and opportunities for interaction particularly for children, older adults, and individuals with disabilities. The expansion was considered beneficial for commuting and social mobility, especially for those without access to cars, offering shorter travel times, improved access to work and education, and greater opportunities for social engagement. However, the report also identified risks such as high noise barriers that could increase the physical divide between neighborhoods, and poorly designed crossings or stations that could contribute to feelings of insecurity, particularly among vulnerable groups.

In Ödåkra, UA1 retained the station in the town center, which supported accessibility but intensified the barrier effect. UA3 relocated the station outside the town, reducing noise and physical separation but compromising access for those most in need. The zero alternative, with increasing traffic and no infrastructure upgrades, was expected to further reduce access and weaken social cohesion over time. Ultimately, the report identified UA1 as the most socially sustainable option, provided it was complemented by thoughtful design measures such as transparent noise barriers and well-lit, secure crossings to support safety and cohesion.

5.2.3. Stakeholder Influence and Participation

Although contractors and consultants had limited influence during the planning phase, they believed they were still able to contribute to social sustainability through practical, locally driven initiatives. Several such efforts were initiated and implemented by Skanska. According to the Project Manager, the main contributions during the construction phase focused on ensuring fair working conditions, particularly by verifying that all employees and subcontractors, including foreign labor, received appropriate wages, insurance, and safe working environments, in accordance with Trafikverket's general sustainability requirements.

The Environmental Consultant from Crabat explained that, for example, butterfly meadows had been created by repurposing surplus soil to establish green areas with wildflowers, promoting biodiversity and ecosystem services. Measures were also taken to enhance safety and accessibility, including station upgrades, the replacement of level crossings with pedestrian and bicycle tunnels, and improved lighting, particularly in Kattarp, where residents reported an increased sense of security. The consultant further noted that the project improved transportation and social inclusion by reducing travel time between locations such as Kattarp and Helsingborg to 13 minutes, thereby increasing access to jobs and education and encouraging greater use of public transport.

In addition, bat screens were constructed to guide bats over the railway, with ivy added to improve visual appeal for passersby. These initiatives illustrated that, despite having limited influence over major decisions, contractors were still able to contribute to social sustainability through practical, locally grounded efforts.

While contractors and consultants were able to contribute to social sustainability through practical measures, challenges emerged in the collaboration among project stakeholders. Both the Project Manager from Skanska and the Environmental Consultant from Crabat pointed to poor cooperation between Trafikverket and Helsingborg municipality. According to them, coordination was hindered by each party prioritizing its own perspective over consensus, which unnecessarily prolonged the decision-making process. This led to inefficiencies, for example, the delayed approval of noise barriers in Ödåkra not only postponed construction but also resulted in a fourfold cost increase, according to the Project Manager. The Environmental Consultant added that the situation escalated to the point where local residents had to organize and pressure the municipality to approve the permit, highlighting the perceived importance of the noise barriers within the community.

Using Arnstein's (1969) Ladder of Participation, the Ängelholm–Maria project appeared to reflect a low to moderate level of participation, mainly at the levels of consultation and placation. According to the interviews, key decisions were made early in the planning phase, largely based on comprehensive impact assessments, with limited integration of social values or citizen input. While a SIA was developed, it was not actively followed up or embedded in later stages. In some cases, such as the discussion around noise barriers in Ödåkra, local residents engaged actively to make their concerns heard, suggesting that influence was possible but limited.

5.2.4. Trade-offs

While citizen input was limited, more weight was placed on formal evaluations and economic calculations. In early 2007, Banverket conducted a socioeconomic assessment in which they calculated the social benefits with the economic feasibility. In this assessment they compare the two alternatives, the later on chosen one, UA1, and the second best alternative, UA3, against the zero alternative, and assess their socioeconomic effects (Banverket, 2007). Banverket stated that the Net Present Value Quota (Nettonuvärdeskvot, NNK) for both alternatives was negative, meaning that the investment costs outweigh the monetarily measurable benefits. A negative NNK indicated that the project was not strictly economically profitable, as the large investment costs (1,176 million SEK for UA1 and 1,255 million SEK for UA3, in 2007 prices) were not fully offset by the estimated financial benefits. However, the socioeconomic assessment emphasized that while the strict economic profitability is low, the project still brought significant benefits in terms of travel time savings,

increased railway capacity, safety improvements, and regional development. The analysis also highlighted that full benefits would only be realized when the entire Västkustbanan is double-tracked.

According to the Strategic Planner at Trafikverket, socioeconomic benefit was the most influential factor in the prioritization of infrastructure measures in the early planning phase. This means that elements which can be quantified in monetary terms, such as reduced travel times and fewer accidents were given precedence over social values that are more difficult to measure. Although aspects like gender equality and public health were included in Trafikverket's comprehensive impact assessments, the Strategic Planner emphasized that in practice, it is the quantifiable benefits that guided decision-making during the initial stages. They also described a concrete trade-off between local and regional benefits, noting that interventions which serve larger population groups were prioritized over those that primarily benefit smaller communities, even if this may be perceived as unfair:

> *"A measure that benefits more people is prioritized higher than a measure that benefits fewer.* That's just how it is".
>
> - *Strategic Planner at Trafikverket*

5.2.5. Long-term Outcomes

Since the project had been completed relatively recently, many of its long-term effects had not yet taken shape or been fully evaluated. None of the interviewees explicitly mentioned any systematic follow-up or analysis of the project's broader societal outcomes. While certain improvements, such as reduced travel times, enhanced station environments, and better accessibility were noted, these were primarily discussed in terms of immediate project outcomes rather than long-term social impact. As such, it remained uncertain how the double-track expansion had affected the local communities over time or contributed to broader regional development goals.

5.3. The Case Projects Through the Lens of the Theoretical Framework

This chapter analyzes the Gothenburg–Trollhättan and Ängelholm-Maria double-track railway projects through the lens of the theoretical framework outlined earlier, which is based on Social Impact Assessment (Vanclay, 2003), Stakeholder Theory (Freeman, 1984), and Arnstein's Ladder of Participation (1969). Rather than simply describing outcomes, the analysis focuses on how the project was planned, designed, and implemented in relation to key dimensions of social sustainability. From the twelve social impact categories presented in the framework, six have been identified as particularly relevant for assessing the social sustainability of these cases. These are:

- Demographic changes
- Access to social services
- Lifestyle and daily life
- Environmental-related social effects
- Safety and crime
- Political influence and participation

These categories were selected based on their direct relevance to railway infrastructure and social sustainability, and their prominence in both the empirical material and previous research, as outlined in Section 3.2 of the theoretical framework.

Demographic Changes is important because railway infrastructure can influence population migration and social cohesion, especially by altering access between urban and rural areas. Access to Social Services plays a key role in ensuring equitable distribution of essential resources, with improved transport links enhancing access to healthcare, education, and public services. Lifestyle and Daily Life is crucial as it reflects how transportation changes affect daily routines, social networks, and social mobility. Environmental-related Social Effects are significant due to their direct impact on public health and well-being, particularly concerning noise and pollution from railway projects. Safety and Crime is linked to how railway infrastructure affects community security, with well-designed stations potentially reducing crime and increasing social safety. Finally, Political Influence and Participation is central to ensuring that local communities are included in decision-making processes, fostering transparency and trust.

The omission of some categories, such as Cultural Impact, Labor Market and Economy, and Land Use and Resource Distribution, was based on their relative secondary importance in this particular study. Although these factors are certainly significant in broader social sustainability discourse, they are less directly connected to the specific context of railway infrastructure development in Sweden. Cultural Impact, for example, tends to be more shaped by migration or tourism than by infrastructure projects themselves, while Labor Market and Economy and Land Use and Resource Distribution focus more on economic and land-related outcomes that, while important, do not directly align with the social sustainability lens of this study.

By focusing on these six categories, this study aims to provide a nuanced understanding of the social sustainability outcomes of the Gothenburg–Trollhättan and Ängelholm-Maria railway projects. These categories provide a comprehensive framework for analyzing how the projects have influenced, and been influenced by, social factors in the affected municipalities, emphasizing the interplay between infrastructure development and community well-being.

5.3.1. Demographic Changes

Vanclay (2003) highlights that demographic changes, such as shifts in population size, age, or diversity, can have significant social impacts. These changes may strain local resources or alter the social structure, influencing integration or segregation within communities. Railway infrastructure can contribute to such changes by influencing migration patterns and urbanization, but these effects are context-dependent and not always predictable.

Gothenburg–Trollhättan

The Gothenburg–Trollhättan project coincided with notable population growth in the municipalities along the upgraded railway. Between 1999 and 2023, most of these municipalities experienced population increases exceeding the national average of 19% (SCB, 2024). Improved commuting opportunities and accessibility to Gothenburg were identified in interviews with Trafikverket as likely contributors to this development. However, it is important to recognize that population growth is shaped by a combination of factors, including local housing development, job creation in urban centers, and national demographic trends. For example, municipalities such as Ale and Lilla Edet, which benefited from the railway upgrade, grew more than neighbouring municipalities like Mark or Lerum, which either did not receive major rail investments or were already well connected (SCB, 2024). This suggests that while infrastructure improvements can catalyze demographic shifts, they operate within a broader set of regional dynamics.

Commuting statistics further support the interpretation that the railway enhanced regional labor market integration. In several municipalities, the share of residents commuting to Gothenburg increased substantially during the project period (SALAR, 2023), reinforcing the role of improved rail accessibility in shaping where people live relative to where they work. This pattern, in turn, likely contributed to the observed rise in housing demand in smaller towns along the line.

At the same time, these changes raise important questions regarding social sustainability. According to Vanclay (2003), rapid demographic shifts can create tensions in the social structure, particularly if population growth is not accompanied by corresponding investments in housing, public services, and social integration. In this case, several respondents from Trafikverket described rising housing prices in towns such as Lödöse and Lilla Edet as a sign that these areas had become more attractive to live in due to improved accessibility. While rising property values are not necessarily negative, they may reduce housing availability for certain groups, especially if supply does not keep pace with demand. Over time, this could affect social cohesion, for example by making it harder for some households to establish themselves in the housing market. However, the interview material does not indicate that such effects were

perceived as problematic. Rather, the development was primarily highlighted as a positive outcome, which underscores the importance of considering multiple perspectives when interpreting demographic effects in relation to social sustainability.

Ängelholm–Maria

In the Ängelholm–Maria project, although demographic change was not directly assessed in Trafikverket's official project materials, the potential for significant demographic impact is embedded in the project's goals and anticipated outcomes. The expansion of the double-track section of the Västkustbanan explicitly aimed to support longer commuting distances and strengthen regional development (Trafikverket, 2018b). The commuting statistics support this dynamic, in Ängelholm, 46% of residents commuted to other municipalities, primarily to Helsingborg (SALAR, 2023). The reduction of travel time between Kattarp and Helsingborg to just 13 minutes effectively deepens labor market integration between these towns, potentially encouraging in-migration from people seeking more affordable housing while working in Helsingborg or Malmö. Over time, this could shift both the social structure and the population density in these municipalities. As Vanclay (2003) cautions, such changes, while often perceived as economic progress, can also place pressure on local resources and alter the social fabric, particularly if demographic changes outpace investment in social infrastructure.

Additionally, the corridor design decisions reinforced this impact. For instance, retaining the station in central Ödåkra (UA1) maintained the area's commuter functionality, ensuring that the town remained an attractive residential option for people working in urban centers. In contrast, the alternative route (UA3) that would have relocated the station outside town was dismissed partly due to concerns about reduced accessibility and passenger numbers. This highlights how technical decisions about alignment and station placement carry long-term consequences for the population's spatial behavior, and by extension, local demographics, aligning with Vanclay's (2003) argument that infrastructure deeply influences where and how people choose to live.

5.3.2. Access to Social Services

Access to essential services, such as healthcare, education, and public transport, is recognized in the SIA framework as a foundational component of social sustainability (Vanclay, 2003; IISD, 2016). According to Vanclay, access to public services is not only a matter of geographic proximity but also of the ability to use and benefit from these services on equal terms. In this context, transport infrastructure serves as an enabler, but not a guarantee.

Gothenburg–Trollhättan

One of the most prominent social effects of the double-track expansion between Gothenburg and Trollhättan is the improved access to public services for residents in smaller towns along the railway. Faster and more frequent train connections to Gothenburg have enabled residents in these places to better access education, healthcare, and other essential public services. In interviews with Trafikverket, this was highlighted as a clear example of how infrastructure can create new life opportunities, particularly for groups that have previously faced limited geographic mobility. Improved mobility can thus be understood as a tool for counteracting social exclusion which is an aspect that Vanclay (2003) emphasizes as central to social sustainability.

While improved commuting options open doors to social services, it also requires that municipalities and institutions along the railway corridor have the capacity to accommodate increased demand. However, there is a lack of analysis regarding whether these municipalities were equipped to handle the added pressure on service functions, an issue that is crucial for ensuring long-term social sustainability.

Ängelholm–Maria

A project's ability to enhance or hinder access to services can profoundly affect equity and inclusion. In the case of the Ängelholm–Maria expansion, access was both a direct benefit and a strategic goal, especially in smaller towns which previously had limited access to regional services. The SIA conducted by Tyréns AB (2007) explicitly pointed out how the project would benefit socially vulnerable groups, children, elderly people, and those with reduced mobility, by improving accessibility to services located in larger cities. Through upgraded stations, pedestrian tunnels, and redesigned public areas, the project aimed to increase safety and inclusiveness. This aligns with Vanclay's (2003) emphasis on ensuring that infrastructural interventions enhance, not restrict, access to social support systems. The SIA also warned that failing to implement these accessibility improvements could exacerbate exclusion for groups already marginalized by geographic or economic constraints. The broader project rationale, to reduce travel times and link people more efficiently to larger labor and service markets, demonstrates an implicit strategy to enhance access.

5.3.3. Lifestyle and Daily Life

Vanclay (2003) notes that changes in lifestyle and daily routines can significantly affect social sustainability. Transportation infrastructure, by improving mobility and access to opportunities, can enhance the quality of life by reducing barriers to work, education, and social activities. However, it can also create disruptions if the infrastructure leads to social isolation or divides communities.

Gothenburg–Trollhättan

In the case of Gothenburg–Trollhättan, it is relevant to reflect on how improved accessibility has reshaped the conditions of everyday life. With increased frequency and shorter travel times, it has become possible for more people to live outside the city without losing access to the Gothenburg labor market. According to representatives from Trafikverket, this has also led to a noticeable increase in housing demand in the A2 municipalities affected by the project (SALAR, 2023). This suggests that the choice of residence is increasingly influenced by lifestyle preferences, such as living near nature and quieter environments, rather than the location of one's workplace. This aligns with Vanclay's (2003) broad understanding of social impact, where lifestyle, mobility, and sense of place are seen as central components of people's social reality. The railway expansion thus becomes not only a matter of physical transport capacity, but also a question of what kinds of life choices and residential patterns are made possible and for whom.

Ängelholm–Maria

In the Ängelholm–Maria project, changes to lifestyle and daily routines were reflected in multiple ways. Most tangibly, shorter travel times created opportunities for residents to expand their daily geographies, whether for work, school, or leisure. In particular, improved connections to Helsingborg meant that people living in smaller towns could more easily participate in the economic and social life of a larger city. This has direct implications for social inclusion and economic opportunity, particularly for residents without access to private cars. Station environment upgrades also altered the day-to-day experience of public space. In Kattarp, lighting and layout improvements made public transit not only safer but more pleasant. This aligns with Vanclay's argument that social sustainability includes subjective experiences of comfort, dignity, and belonging in public settings. The Environmental Consultant from Crabat noted:

> *"People in Kattarp felt safer after the lighting upgrades and the new pedestrian tunnels. That's something we got clear feedback on."*
>
> - *Environmental Consultant at Crabat*

However, there were also negative lifestyle implications, particularly in Ödåkra. The decision to follow alternative UA1 kept the rail line and station in the town center, preserving access but exacerbating the barrier effect, as identified both in the Tyréns SIA and by Trafikverket. The high noise barriers required to reduce disturbance were perceived as a visual and physical divider within the town, potentially disrupting pedestrian flow, neighborhood interaction, and feelings of cohesion. Vanclay (2003) emphasizes that even indirect effects, like spatial fragmentation, can erode quality of life, particularly when not anticipated or mitigated. The planned design mitigations,

such as transparent barriers and well-lit crossings, reflected an awareness of this risk, but without long-term follow-up, it remains unclear whether these were sufficient.

5.3.4. Environmental-related Social Effects

Environmental impacts, such as noise, pollution, and changes to local ecosystems, are key factors influencing public health and social well-being (Vanclay, 2003). Railway infrastructure projects often generate such impacts, which can disproportionately affect vulnerable populations. Effective Environmental Impact Assessments (EIA) are needed to mitigate these effects and ensure that they do not undermine social sustainability.

Gothenburg–Trollhättan

In the Gothenburg–Trollhättan project, an Environmental Impact Assessment (EIA) was conducted, with the primary focus on technical and ecological aspects such as noise, landscape alterations, and land use. The social dimensions of environmental effects, such as barrier impacts and the loss of green spaces were not addressed from a social perspective. This reflects an institutional logic that Vanclay (2003) warns against, where social consequences are often deprioritized in planning processes in favor of factors that are easier to quantify and measure. In practice, this means that people's experiences of place, access to nature, and impacts on quality of life are often overshadowed, despite being central to everyday life and long-term well-being. Interviews with representatives from Trafikverket confirm that the concept of social sustainability did not have a clear role in the project's governance during the planning and implementation phases. There was no structured process in place to identify and evaluate social effects related to the environment, which was also the reason why such aspects were not systematically considered.

Ängelholm–Maria

The Ängelholm–Maria project's environmental-related social effects were most visible in noise management and the integration of small-scale ecological enhancements with aesthetic and social benefits. The project showcased best-practice examples of how environmental interventions can generate social value. The decision to use surplus soil to create butterfly meadows introduced a form of green infrastructure that supported biodiversity while also improving the visual experience of the area. Bat screens, fitted with climbing ivy, served both ecological and aesthetic purposes. These examples align closely with Vanclay's (2003) principle of integrated thinking, where social, ecological, and economic considerations reinforce rather than compete with one another. By incorporating small-scale, community-oriented ecological enhancements, the project demonstrated that even in highly technical domains, social sustainability can be advanced through design sensitivity and local adaptation.

5.3.5. Safety and Crime

Vanclay (2003) argues that safety, both physical and social, is essential for the well-being of communities. The design and implementation of transport infrastructure can affect the safety of public spaces. Well-planned railway stations and surrounding areas can enhance social safety by reducing crime and fostering a sense of security, whereas poorly designed spaces can increase vulnerability to crime.

Gothenburg–Trollhättan

In the Gothenburg–Trollhättan case, safety was addressed through several physical design interventions, even if the term social sustainability was not systematically used at the time. Key measures included the removal of level crossings and the construction of overpasses to reduce accident risks and improve traffic flow. In some areas, particularly where roads intersected with the railway, decisions were influenced by public consultation. One example involved replacing a proposed tunnel with an overpass after local women raised concerns about safety, highlighting how the built environment can affect perceptions of security in line with Vanclay's definition of safety.

Although no formal SIA was carried out, safety concerns were still addressed through functional and technical solutions that contributed to both physical and perceived safety. Broader crime prevention strategies were not prominent in planning documents, but interventions such as improved crossings and coordinated station placements suggest that social safety was taken into account in practice. In the context of its time, the project reflects a growing awareness of how infrastructure can shape safe and accessible environments for local communities.

Ängelholm–Maria

In the Ängelholm–Maria case, safety was one of the most explicitly addressed social concerns, with several interventions designed to reduce risks and improve feelings of security. The removal of level crossings, a major feature of the project, was directly intended to reduce the risk of collisions and increase traffic safety. Additionally, pedestrian and bicycle tunnels were constructed to create safer crossings, and lighting was upgraded in several station areas. These interventions significantly improved the everyday experience of residents, many of whom reported feeling safer after the improvements according to the Environmental Consultant at Crabat. This aligns with Vanclay's emphasis on the importance of safety not only as a measurable reduction in accidents but as a prerequisite for social participation and psychological well-being.

The SIA from Tyréns (2007) warned that certain design elements, such as tall, opaque noise barriers or poorly lit underpasses, could paradoxically reduce safety by creating isolated or hidden spaces. These risks were taken seriously and were incorporated through transparent materials and open sightlines where possible. However, the full effectiveness of these solutions had not been evaluated by the time of the interviews, leaving questions about long-term social safety impacts unanswered.

5.3.6. Political Influence and Participation

Vanclay (2003) strongly argues that meaningful participation is not just a value but a necessity in ensuring that projects respond to real community needs. His approach is supported by Arnstein's (1969) Ladder of Participation, which distinguishes between genuine citizen power and more symbolic forms of involvement.

Gothenburg–Trollhättan

Public consultation has long been a central part of the planning process for major infrastructure projects in Sweden, and the Gothenburg–Trollhättan case demonstrates how this process, in certain instances, led to tangible changes in the project's design. A clear example is the selection of alternative 1 for the alignment between Lärje and Älvängen, which followed extensive dialogue with residents and local stakeholders. In Alvhem, strong requests were made for the railway to be routed on the eastern side of the community, an outcome that was ultimately implemented. These examples suggest that the perspectives of citizens were not merely documented, but were also taken into account in critical decision-making moments.

Ängelholm–Maria

Perhaps the most significant gap between theory and practice in this case concerns participation, in the Ängelholm–Maria project, participation was limited. While public consultation was formally part of the planning process, decisions, such as the choice of corridor and the weighing of trade-offs, were largely driven by cost-efficiency analyses and socioeconomic modeling. The Strategic Planner at Trafikverket confirmed that elements like travel time savings and accident reduction were given more weight than social or qualitative concerns. This approach reflects what Arnstein (1969) would describe as consultation or placation, where the public is informed or heard, but not empowered to shape outcomes.

Moreover, the SIA conducted by Tyréns AB was not used systematically throughout the project according to the interviewees that were unaware of the SIA's existence. This lack of continuity suggests a disconnect between early planning and implementation, undermining Vanclay's (2003) call for adaptive, participatory planning that evolves with the project lifecycle. However, local residents in Ödåkra were able to exert some influence through self-organization, pushing the municipality to approve long-delayed

noise protection. While this illustrates a form of bottom-up engagement, it also reflects a failure of formal participation mechanisms. According to Vanclay, projects that rely on community protest for responsive action are not examples of participation, but of its absence.

5.4. Reflection on the Projects' Main Similarities and Differences

Both the Gothenburg–Trollhättan and Ängelholm–Maria projects showed several common features in how they have influenced social sustainability in the affected municipalities. In both cases, improved accessibility has had a clear impact on residents' ability to access labor markets, education, and public services in larger cities. This, in turn, has shaped everyday life, lifestyle choices, and regional integration, particularly for smaller towns along the routes. Technical measures related to safety and the environment, such as grade-separated crossings, noise barriers, and improved lighting have also had social consequences in both projects, especially in terms of perceived safety and accessibility in public spaces. Although both projects have, to some extent, lacked a comprehensive structure for managing social impacts throughout the entire planning and implementation process, specific interventions in both cases have still contributed to addressing key social aspects in different ways.

5.4.1. Assessing Social Sustainability Through the Voices of Stakeholders

While most of the social impact categories were addressed throughout the interviews with respondents from both case projects to varying extents, their prioritization and perceived importance differed significantly. As part of the interview process, respondents were asked how they define and work with social sustainability in their respective roles. Based on their answers, a SIA has been constructed to evaluate how each project relates to the twelve impact categories presented in the theoretical framework, adapted from Vanclay's work.

It is important to emphasize that the assessments presented in table 8 are based solely on interview responses. This means that even if certain impact areas have been addressed in project documents, planning materials, or other forms of communication, they are not captured here unless explicitly mentioned by interviewees. To provide a nuanced picture rather than a binary classification, each category has been assessed according to the following three degrees of inclusion:

- **Explicit** - Explicitly, yes, this has been addressed and is seen as a clear aspect of social sustainability.
- **Implied** - It can be interpreted as an example that has been provided that can be linked to this impact category.
- **Lack** - It is missing from the discussion, it has not been addressed.

Table 8. This table presents the results of the Social Impact Assessment based on the interview responses from the two cases. It shows which impact categories were mentioned in interviews with individuals from each respective case and provides a comparative overview of how the different categories were prioritized between the projects. Horizontally, G-T represents Gothenburg-Trollhättan, and Ä-M represents Ängelholm-Maria. Vertically, the table lists the chosen impact categories from the assessment. The lightest shade of green highlights the categories explicitly mentioned in the interviews, the medium green symbolizes the categories that were implied, and the darkest green represents those categories that were not mentioned in the interviews.

Impact Category	**Inclusion (G-T)**	**How (G-T)**	**Inclusion (Ä-M)**	**How (Ä-M)**
Demographic changes	Implied	Increase in population and housing developments near stations like Lödöse.	Implied	Increased accessibility led to more people moving to areas like Kattarp.
Labor market and economy	Explicit	Said when talking about effects in the smaller municipalities, such as Ale: *"Many companies have better opportunities to recruit now, because it's easier for people to commute"* • *Communications Manager at Trafikverket*	Lack	Not explicitly mentioned or implied. However, during construction project-workers often shopped in local stores.
Access to social services	Implied	Noted better access to urban services, through more reliable and frequent train departures.	Implied	Implied because of shorter commuting times between the smaller towns and the cities.

Infrastructure and housing	Explicit	Expansion of transport infrastructure led to rising housing demand. *"New residential areas were established in proximity to the stations, which contributed to local growth"* • *Project Manager at Trafikverket*	Explicit	Ödåkra and Kattarp are seeing a higher number of people moving there. It was implied that it was because of the updated stations. *"Kattarp has gone from being a small village to... more people moving in because there is a train station."* • *Environmental Specialist at Crabat*
Cultural impact	Lack	Not explicitly mentioned.	Lack	Not explicitly mentioned or addressed in any way.
Lifestyle and daily life	Lack	Commuters experienced significant improvements in daily travel times. However, this does not imply significant lifestyle or daily life changes in accordance with the literature definition.	Lack	Residents now experience easier commuting and improved connectivity.. However, this does not imply significant lifestyle or daily life changes in accordance with the literature definition.
Environmental-related social effects	Implied	IThe importance of working on all three sustainability measures was mentioned.	Explicit	The Environmental Consultant from Crabat links biodiversity to social sustainability by mentioning initiatives like butterfly meadows,

				where materials are reused to create green spaces with wildflowers, enhancing biodiversity. While not directly used by the public, it benefits the local environment, ecosystem services and well-being, indirectly contributing to social sustainability.
Safety and crime	Explicit	Safety concerns influenced design choices, such as avoiding tunnels in some areas. *"When we discussed a local road we saw that young girls was against a tunnel because of safety concerns"* • *Project Manager at Trafikverket*	Explicit	Improved lighting and removal of level crossings enhanced safety. Additionally, during construction it was addressed to protect both workers and the public from potential dangers from each other.
Political influence and participation	Implied	Consultation was a fundamental part of the design, where locals could address their concerns. Most questions of social sustainability were addressed here.	Lack	The Project Manager at Skanska emphasized that there was a lack of citizen influence and participation.

Land use and resource distribution	Implied	The choice of corridor was made in part to take as little new land as possible in possession.	Implied	Reuse of excavated earth to create butterfly meadows instead of disposal, optimizing land use.
Attitudes and acceptance of the project	Explicit	Initially met with skepticism, but attitudes improved as benefits became visible. *"At first, many were skeptical about the railway, but as the project progressed, interest and acceptance increased"* • *Communications Manager at Trafikverket*	Implied	Initial skepticism turned into increased acceptance as benefits became evident. *"There was some skepticism at first, but people now see the benefits of better transportation options."* • *Environmental Specialist at Crabat*
Health and well-being	Explicit	Increased accessibility improved quality of life for residents and commuters. *"We see that areas that have gained better access to public transport have also experienced improved quality of life."* • *Project Manager at Trafikverket*	Explicit	Better commuting options and reduced noise pollution contributed to well-being. *"We have replaced windows on several properties to reduce noise, and it has had a positive effect."* • *Environmental Specialist at Crabat*

5.5. Overarching Interview Reflections

The interviews conducted provided valuable insights that, while not always directly applicable to the two specific cases under investigation, offered a broader understanding of the sector. Many of the discussions centered around general knowledge and overarching ideas within the field, helping to explain the current state of affairs on a more general level rather than offering specific case-based examples. Presented below are several key themes that emerged across all interviews, including the definition of social sustainability, the lack of a standardized framework, stakeholder responsibilities, the balancing of benefits within projects, contributions to decision-making, and the opportunities and challenges involved. These themes form the foundation for understanding the complexities of social sustainability and stakeholder dynamics in infrastructure projects.

5.5.1. The Definition of Social Sustainability

Many respondents mentioned that social sustainability is a concept that can be difficult to define. The Program Coordinator for Planning and Social Perspectives from Trafikverket perceives social sustainability as broad and fluffy, and argues for the need to break it down into concrete components to make it applicable in planning processes.

> *"Social sustainability needs to be broken down into a few steps to really understand what is meant by it..."*
>
> - *Program Coordinator Planning and Social Perspectives at Trafikverket*

The Strategic Planner from Trafikverket indicated that the broad definition and extensive scope of social sustainability contributed to the difficulty of integrating it in a consistent manner. The Project Manager from Skanska agreed and pointed out that there are significant challenges in concretizing and implementing social sustainability in larger infrastructure projects due to the lack of a unified definition of the concept. The Project Manager explained that different actors, such as Trafikverket, Skanska, Sweco, the municipality, and others, have their own interpretations of what social sustainability means which created uncertainty about what should actually be prioritized in the projects.

The Project Manager at Skanska said that it could be explained from different viewpoints, from the contractor's point of view social sustainability was described as a broad and multifaceted concept with different interpretations depending on the perspective. From the public's perspective, it involves creating safe and well thought out environments at stations, while from a project perspective, it includes fair working conditions for employees, including foreign workers. The Environmental Consultant from Crabat, strongly associates social sustainability with ecological sustainability,

noting that solutions made for the environment often result in social sustainability as well.

The Senior Investigation Manager Social Sustainability at Trafikverket described social sustainability as putting people in focus instead of infrastructure and meant that it is about living environments, barriers and safety, not just travel times and traffic capacity. As expressed in the interview:

> *"It's not just about rail traffic and traffic accessibility, it's also about the surrounding living environments."*
>
> - *Senior Investigation Manager Social Sustainability at Trafikverket*

The Specialist Landscape Architect from Trafikverket had experience working with social sustainability through physical design and defined social sustainability in infrastructure projects as ensuring that the physical environment contributes to a just and inclusive society. They emphasize the importance of designing accessible spaces that accommodate diverse needs, including children, the elderly, and individuals with neuropsychiatric or physical disabilities.

The Project Manager and Communications Manager from Trafikverket saw social sustainability as part of an overall sustainability assessment, which also included ecological and economic sustainability. They emphasized the importance of integrating social sustainability into the early planning stages, which has been done with environmental aspects for many years. The Project Manager from Skanska further argued that it should not be an afterthought but a fundamental component of planning and execution. Further the Senior Investigation Manager of social sustainability expressed that when working with social sustainability you have to take a holistic perspective and not just look at who is responsible for what. The Project Manager from Skanska asserted that social sustainability was equally significant as economic and ecological sustainability, especially in large infrastructure projects funded by public resources. Reflecting on the evolution of its importance, he noted,

> *"It's not more important, but it's getting more focus. It's probably always been just as important, but it's more visible and it needs to be more visible"*
>
> - *Project Manager at Skanska*

A common theme among the interviewees, particularly those working in the project phase, is the emphasis on safety and security as central components of social

sustainability. Measures such as improved lighting, pedestrian and bicycle underpasses, and the removal of level crossings are highlighted as clear efforts to create safer environments around stations and crossings. These types of physical improvements were described as concrete and tangible outcomes of social sustainability work, indicating that safety has become a key aspect of how social values are addressed in practice. One possible explanation for this focus is that safety is a social value that can be measured, communicated, and integrated into technical solutions. In contrast to more abstract or long-term social goals, such as participation or equality, safety becomes something that both clients and contractors can translate into physical interventions.

5.5.2. Lack of Framework

Regarding social sustainability, the Strategic Planner from Trafikverket explained that Strategic Planners worked with comprehensive impact assessments (SEB) as a framework to analyze and evaluate various consequences of infrastructure projects. However, they mentioned that while this framework included social sustainability as one aspect, it was not specifically designed for it, and its application in this regard was not always consistent. Although social factors could be considered within these assessments, it was unclear which specific aspects were included or how they were prioritized. This could suggest that while a framework existed, social sustainability was not systematically integrated into early stage planning but rather addressed more implicitly through other transport policy goals. Furthermore, it was mentioned by the Strategic Planner at Trafikverket that SIAs were sometimes conducted at the project level but were not systematically applied in the planning phase, meaning that social aspects were often evaluated later in the process rather than as a fundamental part of the initial planning.

The Senior Investigation Manager for Social Sustainability explained in the interview that Trafikverket has clearer guidance and requirements when it comes to child impact assessments, gender equality, and accessibility for people with disabilities. These areas are supported by legislation, regulations, or government assignments, which makes them more established within the agency's operations compared to social sustainability as a whole. However, there is no comprehensive framework that covers the full scope of social sustainability, which means that several important aspects, such as socio-economic distribution, safety, and barrier effects, lack formalized methods or mandatory procedures.

In the interview, the Senior Investigation Manager for Social Sustainability at Trafikverket described how work with social issues has largely emerged through individual initiative rather than through clear organizational directives. It has often been driven by internal champions in different parts of the agency, for example, environmental specialists within the investment division, who, on their own initiative,

began working with social sustainability and formed networks to develop methods. The lack of an overarching framework and clear guidelines means that implementation is uneven and often depends on which consultant is hired or the level of engagement within the project team. As stated in the interview:

"Social sustainability is kind of driven by internal champions, and it depends on the individual"

- *Senior Investigation Manager for Social Sustainability at Trafikverket*

To strengthen the inclusion of social perspectives in early stages, a guidance document for feasibility studies has been developed. However, there are still no requirements to carry out a full SIA.

"It is very rare to produce a completely independent report in the form of a social impact analysis"

- *Senior Investigation Manager for Social Sustainability at Trafikverket*

In the interview with the Project Manager and Communications Manager from Trafikverket they mentioned that there is a need for clearer guidelines and structures to work with social sustainability in projects. They stated that Trafikverket has improved in integrating social, economic, and ecological factors into sustainability assessments, but they emphasized that Trafikverket and project managers needed more structured tools to ensure that social sustainability was properly integrated and followed up throughout the entire project process. According to the Skanska Project Manager, a shared understanding and clearly defined, concrete measures for social sustainability are needed that can be implemented and followed up in practice.

The Program Coordinator for Planning and Social Perspectives and the Specialist Landscape Architect from Trafikverket underline the absence of a unified framework within the agency for integrating social sustainability into all project phases. The Specialist Landscape Architect notes that while strategic documents exist, there is a gap in translating these into project-specific requirements. They describe this as a "translation issue" from strategic ambitions to project-level actions. The Specialist Landscape Architect describes that it has been difficult to integrate social sustainability into existing processes, stating:

"We're trying to incorporate these issues into our processes… but it turned out to be a bit complicated."

- *Specialist Landscape Architect*

No specific reasons are given, but a possible explanation is offered by the Senior Investigation Manager for Social Sustainability at Trafikverket, who highlights that the agency's planning procedures are often slow and rooted in traditional methods. These established models and slow decision-making structures are described as factors that can delay or hinder the integration of new perspectives such as social sustainability. Together, these insights point to how organisational structures may pose barriers, even when there is internal motivation to advance the work. But the Program Coordinator for Planning and Social Perspective emphasizes that method development is ongoing, and foresees the establishment of clearer methodologies over time.

5.5.3. Stakeholder Responsibilities to Drive Social Sustainability Forward

According to the Strategic Planner from Trafikverket, who worked during the early planning phase before project managers were involved, infrastructure development was shaped at the political level. Therefore, they believed that politicians carried the primary responsibility for driving social sustainability forward. The Strategic Planner said that the Swedish Government had formulated transport policy goals, which formed the foundation for how the transport system was planned and how Trafikverket should work. These goals consisted of both functional objectives, focusing on capacity and efficiency, and consideration objectives, where social aspects were given emphasis. The Strategic Planner highlighted that it was within the consideration objectives that social sustainability could have an impact in the planning stage, but they said that decision-making towards social sustainability occurred at multiple levels and was shaped by a variety of stakeholders and their engagement with the subject.

The Project Manager and Communications Manager from Trafikverket also mentioned that the political landscape heavily influenced project priorities. They said that major railway projects required political backing to move forward, and without strong political commitment, even well justified planned or proposed projects could be delayed or abandoned. But they also acknowledged that they, who work within the projects, played a key role in driving social sustainability forward and held significant power to integrate it, as they played a central role in decision-making and were responsible for planning, financing, and overseeing railway expansion projects.

The Specialist Landscape Architect was clear that Trafikverket as an organization holds the main responsibility for managing the social impacts that their infrastructure entails. However, it was highlighted that there was internal ambiguity regarding who within the organization was practically responsible for integrating social sustainability into the projects. The Specialist Landscape Architect explained that if the role or responsibility for social sustainability was unclear or lacking, the responsibility often fell to individual project managers. This meant that, in many cases, it was up to each project manager and project to determine to what extent social sustainability was included in the

planning and implementation, which in turn led to these issues not being handled consistently within Trafikverket as an organization.

The Program Coordinator for Planning and Social Perspectives stated that while Trafikverket must take the lead within its area of responsibility, the responsibility for social sustainability does not lie solely with the agency. It was emphasized that municipalities, regions, and actors such as Västtrafik, which is the regional public transport company, also carry significant responsibility for contributing to socially sustainable infrastructure, and that this responsibility should therefore be shared among multiple stakeholders. The Program Coordinator for Planning and Social Perspectives explained that collaboration with local and regional actors is necessary to achieve broader goals such as accessibility, inclusion, and integration. This view was shared by both the Project Manager at Trafikverket and the Project Manager from Skanska, who argued that while Trafikverket holds the responsibility for a socially sustainable facility, the municipalities hold local knowledge and have a crucial role in ensuring that railway stations, for example, are accessible and integrated into urban planning. The Project Manager from Skanska meant that municipalities and Trafikverket bore the primary responsibility for incorporating social sustainability into railway projects together and explained that they were the ones who set the fundamental requirements that contractors are expected to follow. The contractor held the responsibility to follow through the planning and do it in an honest and transparent way that minimizes cheating with requirements.

The Project Manager from Trafikverket similarly mentioned that collaboration is important:

> *"We must plan together because social development is a shared responsibility. We can do a lot, but we do not own the entire process ourselves. That is why we must collaborate closely, especially with the municipality."*
>
> - *Project Manager at Trafikverket*

5.5.4. Weighing Benefits

The Strategic Planner said that at the core of Trafikverket's decision-making process lies socio economic benefit, which serves as the primary criterion for prioritizing infrastructure projects. According to the Strategic Planner at Trafikverket, projects are ranked based on quantifiable benefits, such as reduced travel time, increased accessibility, and improved traffic safety, ensuring that limited resources are allocated to maximize overall benefit. However, the Strategic Planner noted that pure economic assessments often overlook broader social impacts, which is why Trafikverket conducts comprehensive impact assessments. These evaluations aim to integrate 'difficult to

measure' social aspects such as accessibility, public participation, and gender equality. While the economic framework remains dominant, these complementary assessments help ensure that at least some elements of social sustainability are considered.

Both the Specialist Landscape Architect and the Program Coordinator for Social Perspectives emphasized that legal mandates play a significant role in shaping what is prioritized. The Specialist Landscape Architect highlighted that environmental goals benefit from stronger legal support, such as the Environmental Code and Environmental Impact Assessments, which give environmental issues a structural advantage over social ones. In contrast, social sustainability lacks equivalent legal frameworks, making it more vulnerable to deprioritization. As the Specialist Landscape Architect explained,

> *"There is a lot more environmental legislation... there is an advantage for the environmental side"*
>
> - *Specialist Landscape Architect at Trafikverket*

This structural imbalance was also stressed by the Senior Investigation Manager for Social Sustainability, who described how social sustainability remains less institutionalized compared to other dimensions. The Senior Investigation Manager for Social Sustainability emphasised that there are no legal requirements for conducting SIAs. As a result, their implementation tends to be inconsistent, often depending on the interests and initiative of individual consultants or project leaders rather than being a standard requirement. The Senior Investigation Manager for Social Sustainability argued that to strengthen the influence of social sustainability, it is necessary to establish clearer demands, integrate it more effectively into existing tools such as cost-benefit analyses, and shift focus from aggregate national benefits to local effects and the distribution of those effects.

The Strategic Planner at Trafikverket stated that infrastructure projects often create trade offs, where certain improvements, such as upgrading a single track railway to a double track, increase overall connectivity but may negatively affect smaller communities. The Strategic Planner highlighted that removing level crossings for safety can result in longer pedestrian detours, affecting daily accessibility. Similarly, they brought up that prioritizing high speed intercity rail can lead to station closures in smaller towns, reducing local connectivity in favor of more efficient long distance travel. According to the Strategic Planner, these effects are acknowledged, but since the overall benefits are deemed to have a greater overall effect for a larger portion of the population than relative to the disadvantages for the minorities, such projects are still prioritized. Similarly the Program Coordinator for Social Perspectives noted that budget constraints and the need to justify expenditures often result in social concerns being cut. Since Trafikverket is publicly funded, cost-efficiency and adherence to governmental directives dominate decision-making processes.

Political priorities may lead to investments in regional development, sustainability goals, or other strategic interests that do not necessarily align with the most cost effective infrastructure solutions. Ultimately, projects with the highest socioeconomic benefit take precedence, but government decisions still shape which projects are approved and implemented. While Trafikverket evaluates and recommends projects, the Strategic Planner stated that the final decision lies with the Swedish Government, which has the authority to override strict cost benefit calculations in favor of broader priorities. The Strategic Planner explained that:

> *"... it is politics that is ultimately responsible."*
>
> - *Strategic Planner at Trafikverket*

5.5.5. Contributions in Decision-Making

The Project Manager from Skanska emphasized that a structured decision-making process is essential to ensuring effective project outcomes. They explained that when decision-making is disorganized, inefficiencies arise, leading to delays, miscommunication, and increased cost. This perspective was echoed by the Communications Manager and the Project Manager at Trafikverket, who highlighted that while collaboration between municipalities, Trafikverket, and contractors is necessary, poorly defined responsibilities and unclear coordination often occur. According to the Project Manager from Skanska it can lead to counterproductive competition rather than effective cooperation. Both the Skanska Project Manager and the two representatives from Trafikverket, pointed to past issues where different stakeholders attempted to assert their authority rather than working towards a shared goal, ultimately obstructing progress.

The Communications Manager and the Project Manager at Trafikverket further emphasized that structured processes are necessary to ensure that decision-making is both efficient and inclusive. They emphasized that without a clear framework, decision-making becomes reactive rather than proactive, making it difficult to address social sustainability concerns effectively. They highlighted that past projects, such as Gothenburg–Trollhättan, lacked structured mechanisms for incorporating social sustainability, which led to challenges in balancing competing interests. As a result, Trafikverket has moved towards a more structured approach, integrating stakeholder consultations and predefined evaluation criteria earlier in the process.

Both the Specialist Landscape Architect and the Program Coordinator for Planning and Social Perspectives at Trafikverket noted that consultations had become a central tool for both knowledge gathering and legitimacy. They emphasized that consultations must be structured carefully to ensure inclusion of a broad demographic, not only the traditionally dominant voices. The Specialist Landscape Architect said:

"Consultation is a crucial part…
it is a way for people to have their voices heard"

- *Specialist Landscape Architect at Trafikverket*

However, most of the interviewees from Trafikverket admitted that while public consultations were important, their impact often depended on how well they were structured and at what stage they occurred in the planning process. They explained that consultations with the public must be more structured, as without proper direction, it becomes difficult to manage the responses. Further, the Specialist Landscape Architect noted that, while consultations are legally required, their true value depends on whether the feedback is taken seriously and reflected in decisions. The Project Manager from Skanska emphasized that consultations should focus on essential issues, as excessive data can be overwhelming and hinder effective decision-making. The Trafikverket Communications Manager and Project Manager also emphasized the importance of providing information well in advance, so the public can offer their opinions before decisions are made, rather than after the fact when it's too late to influence the outcome. They further noted that historically, consultations had been less integrated into the process, with earlier stages of consultation being more isolated. Over time, the process has evolved to become more structured and consistently integrated into project development.

The Strategic Planner from Trafikverket emphasized the importance of consultations in infrastructure projects and how they can contribute to a more inclusive decision-making process. Traditionally, older individuals, particularly men, have been overrepresented at consultation meetings. However, during the pandemic, digital consultations enabled a broader range of participants, allowing more young people, including parents with young children, to take part and share their perspectives. The Program Coordinator for Planning and Social Perspectives at Trafikverket emphasizes the importance of feedback loops where public input is not just collected but also used to shape project decisions. The Strategic Planner highlighted this as a positive development and stressed the importance of considering diverse viewpoints,

"if we can adapt our projects based on valuable input, then we do"

- *Strategic Planner at Trafikverket*

The Project Manager at Skanska stated that contractors had limited influence over the overall decision-making process in railway infrastructure projects. This was also communicated by the Environmental Specialist at Crabat, who similarly pointed to municipalities and Trafikverket as those in power throughout the primary decision-making process. They explained that many aspects of social sustainability were determined in the planning phase, before contractors were involved. By the time that contractors were involved, the major design and planning decisions were already made

by Trafikverket and other stakeholders, such as their own consultants. However, the Project Manager from Skanska noted that contractors contribute with practical expertise, particularly regarding detailed solutions, material choices, and implementation feasibility. They emphasized that while contractors could ensure that pre-established requirements were met efficiently, they had little power to shape the overarching project goals and strategies.

The Project Manager at Skanska further pointed out that ensuring social sustainability is not just about setting requirements but also about who gets heard in the decision-making process. They stressed that while sustainability specialists and consultants often work on these issues, their impact depends on whether leadership prioritizes their insights and integrates them into core project decisions. Further, the Skanska Project Manager went on to say that if key sustainability voices remain in isolated roles without influence, their work may have little effect, regardless of formal requirements. Therefore, it is the responsibility of project leadership, both within Trafikverket and contracting organizations, to ensure that the right expertise is given visibility and authority in decision-making. This was echoed by the Project Manager at Trafikverket, who emphasized that responsibility for social sustainability cannot be placed solely on specialists but must be actively driven by those in charge of project execution.

5.5.6. Opportunities and Adversities

The Environmental Specialist at Crabat discussed the positive impacts of railway infrastructure, specifically in terms of economic growth, improved accessibility, and reduced reliance on personal vehicles. The Project Manager at Skanska argued that Sweden is drastically behind in railway development and will remain so for at least the next 100 years if the current pace of expansion continues. They highlighted that if Sweden had simply maintained the railway infrastructure it had 50 years ago and expanded from that level at a good pace, the situation today would be vastly different. Instead, they described an industry that is constantly lagging behind demand, struggling to keep up with growing capacity needs rather than planning proactively. On a similar note, the Communications Manager and the Project Manager at Trafikverket acknowledged that Sweden's railway expansion is consistently reactive rather than proactive, with transport planning underestimating demand and failing to capture long-term benefits. They argued that Sweden's current cost-benefit analysis models fail to account for the full impact of railway expansion, making it difficult to justify investments based solely on economic calculations. The Project Manager at Trafikverket stated:

*"*The plain truth is that if we only used the cost-benefit analysis model as the basis for decision-making, we wouldn't build any railways in Sweden.*"*

- *Project Manager at Trafikverket*

Without strong political commitment, they suggested that almost no railway projects would ever move forward, reinforcing the Project Manager at Skanska's frustration over the lack of decisive action in infrastructure planning. However, the Senior Investigation Manager for Social Sustainability at Trafikverket highlighted the value of having a legal system and decision-making framework with low inertia because it ensures that untested radical changes do not occur that could have unforeseen consequences.

The Project Manager and Communications Manager from Trafikverket believed that Trafikverket's greatest shortcomings in sustainability assessments were related to economic sustainability, not social sustainability. This was because Trafikverket worked with public funds, meaning they had to manage resources carefully. As a result, they could not always choose the most sustainable solutions, as economic factors such as budget constraints and construction feasibility often had to take precedence in decision-making. They emphasized that although social, economic, and ecological sustainability were given equal weight in official assessments, economic and construction aspects tended to have the greatest impact on the alternatives chosen during the planning phase.

Both the Senior Investigation Manager for Social Sustainability and the Specialist Landscape Architect at Trafikverket highlighted that the new laws and regulations around the CRC could be a first step in regulating social sustainability in projects and that it can lay the foundation for how an SIA can be developed and implemented. The Senior Investigation Manager for Social Sustainability argued:

"...you get to include quite a lot of the rest of social sustainability because you get to include the impact of roads and railways on local environments. You get to include barriers, the safety perspective and even gender equality can be included…"

- *Senior Investigation Manager for Social Sustainability at Trafikverket*

The Specialist Landscape Architect further suggested that even simple changes, such as better informing project leaders about these requirements, could significantly improve integration of social perspectives. However, the Skanska Project Manager highlighted that cheating with requirements is something that does occur in the industry today and is not combatted enough seemingly because of a lack of concern from the decision makers in power. This cheating entails things from dishonest paperwork to human trafficking.

The Strategic Planner highlights economic constraints as one of the main obstacles, where a lack of resources can lead to important aspects of social sustainability being deprioritized. Some examples brought forward by the Strategic Planner were measures to enhance perceived safety and accessibility, such as grade separated crossings over or under railways, which may be overlooked if the budget is limited. Even elevators, which are crucial for individuals with disabilities, can become a matter of cost rather than necessity, sometimes resulting in solutions that do not fully meet everyone's needs. Furthermore, the Strategic Planner notes that railway construction can create barrier effects in communities, impacting local residents.

Beyond economic constraints, the Strategic Planner also points to the difficulty of quantifying social impacts, which makes it challenging to measure and compare them with other factors in infrastructure planning. They stated that since social aspects often cannot be converted into clear numerical values in the same way as capacity or cost, they risk being overshadowed in economic evaluations. As a result, social sustainability is often not given the same weight as more measurable factors. The Specialist Landscape Architect pointed out that unclear mandates and policy contradictions often result in trade-offs where “softer” values, like social sustainability, lose out.

5.6. New Approaches for Social Sustainability

Multiple respondents were involved in the planning of the new railway line between Gothenburg and Borås. This project, which spans approximately 60 kilometers of new double-track railway, was designed to improve connectivity and reduce congestion in the region, while also supporting sustainable urban development (Trafikverket, 2025b). Key aspects such as accessibility, noise mitigation, and the integration of local communities into the planning process were emphasized, reflecting the growing importance of social sustainability in large-scale infrastructure projects. Furthermore, the project’s connection to the Västlänken railway and its potential to enhance commuter access to key hubs, including Landvetter Airport, showcased a comprehensive approach to both regional mobility and social well-being. The main difference between this project and the study’s two case projects was that it involved the construction of an entirely new railway. However, the interview responses provided valuable insights of how the work with the concept of “social sustainability” had

evolved over time and how it was addressed during the planning phase of the Gothenburg–Borås section.

The Project Manager, the Communications Manager, the Specialist Landscape Architect and the Program Coordinator for Planning and Social Perspectives from Trafikverket all highlighted that the Gothenburg–Borås project was a model example of working in a systematic and structured way with social sustainability, and that it was significantly more central compared to previous projects they had been involved in. The Project Manager and the Communications Manager stated that in contrast to earlier projects, where social aspects were often addressed reactively (e.g., through consultations), they worked proactively with issues of safety and accessibility already during the planning phase. They emphasized that social sustainability was integrated as a natural part of project planning, rather than being treated as a separate component.

"I don't think we can give ourselves a high score in the railway industry overall, but this project shows that we are heading in the right direction."

- *Communications Manager at Trafikverket*

The Specialist Landscape Architect explained that the project employed several tools to integrate social sustainability, including SIAs, and that the work encompassed both a child rights perspective and aspects related to mobility and spatial design. The Program Coordinator for Planning and Social Perspectives stated that the first SIA for the entire route was carried out as early as 2016 and said that this work had continued throughout the planning process, with various thematic studies conducted in connection with different parts of the project.

A clear example of how social sustainability was integrated into the Gothenburg–Borås project, according to the Project Manager and the Communications Manager from Trafikverket, was the use of sustainability assessments as a central part of the corridor selection process. Rather than considering sustainability aspects retrospectively, the project had incorporated the three dimensions of sustainability, social, economic, and ecological, as equally weighted criteria from the outset. This meant that factors such as safety, accessibility, and the impact on local communities were given the same importance as environmental consequences and cost-efficiency when different alternatives were evaluated.

"It feels outdated to treat social sustainability as a separate issue"

- *Communications Manager at Trafikverket*

6. Discussion

To deepen the understanding of the study's key findings, this chapter offers a more nuanced discussion of three central themes that emerged throughout the research: consultation, the role of champions in advancing social sustainability, and the development of social sustainability practices over time. By revisiting these themes, the discussion aims to critically reflect on how social sustainability is interpreted, implemented, and institutionalized within the context of Swedish railway infrastructure planning.

6.1.1. Consultation - A Central Tool or Just Tokenism?

In both theory and policy, consultation is positioned as a central mechanism for embedding social considerations into infrastructure development. Vanclay's (2003) Social Impact Assessment framework describes consultation not merely as a procedural requirement, but as a proactive and participatory process for identifying, managing, and enhancing social outcomes. When implemented meaningfully, it can support empowerment, transparency, and a redistribution of influence to the communities affected by major projects. Freeman's (1984) stakeholder theory similarly argues that those impacted by a project have a legitimate claim to influence its direction. In Swedish infrastructure planning, consultation is a legally required part of the planning phase, particularly in the development of the railway plan (järnvägsplan), as outlined in *Plan- och bygglagen* (SFS 2010:900) and reinforced by Trafikverket's internal guidelines. Trafikverket (2024c) emphasises the intention to create an inclusive process where municipalities, organisations, and individuals can raise questions and concerns early on. However, several studies suggest that the role of consultation in practice often diverges from its theoretical potential. Antonson and Levin (2020) argue that consultation is frequently reduced to a formal exercise with limited influence on actual decisions. Nilsson and Holdar (2011) add that it tends to be restricted to early project stages and seldom extends to procurement or implementation. These limitations are clearly reflected in the empirical findings from both case studies in this thesis.

A clear difference between the case projects concerns the degree of public participation and influence, as well as how SIA was handled. In the case of Gothenburg–Trollhättan, there are several examples of how input from local residents actually influenced the design of the project, such as the choice of alignment and adjustments made following dialogue with smaller communities. This type of influence can, in Arnstein's (1969) terms, be interpreted as a step toward "partnership," where citizens' voices are not only heard but also lead to tangible changes. In contrast, the Ängelholm–Maria project was shaped by a more technocratic decision-making process, where consultations mainly served as a means of information transfer rather than enabling public involvement in decision-making. Despite the fact that a comprehensive SIA was developed in the

Ängelholm–Maria project and identified key social issues, it was not systematically integrated into project implementation, according to the interviewees. In Gothenburg–Trollhättan, a formal SIA was absent, but social aspects were instead addressed more informally through local dialogue and consultations, which still led to some adaptations. This illustrates that formal tools such as SIA do not automatically ensure a socially sustainable approach. What ultimately matters is the extent to which the results are applied and translated into practice. This supports Åhrén and Parida's (2009) assertion that, even without a systematic framework for SIA, informal processes can influence outcomes in a positive direction, even if they are more disorganized. Their research confirms that, despite the theoretical use of tools like SIA in the Swedish railway expansion, social sustainability has often not been consistently integrated in practice. The case of Gothenburg–Trollhättan further illustrates this point, revealing that the lack of a unified approach to SIA can lead to uneven results. Certain groups may have more influence than others, or social sustainability issues may be underrepresented. This underscores that while informal tools like consultations are important, they cannot replace the need for a more structured and formalized approach to ensure social sustainability in infrastructure projects.

A possible explanation for the differences in how participation and social aspects emerged in the two projects may lie in how these issues were treated during the empirical data collection, particularly in the interviews. In the case of Gothenburg–Trollhättan, where no formal SIA was produced, public consultations and local dialogue became the primary, and perhaps the only way to identify and manage social concerns. It is therefore not surprising that several interviewees emphasized the importance of consultation in this particular case. In Ängelholm–Maria, by contrast, a structured SIA captured many social aspects, which may have reduced the perceived need to highlight the consultation process during the interviews. This does not necessarily mean that consultation was weaker in practice, but rather that the social perspective may have been institutionalized in other ways. This reflection highlights the importance of interpreting interview material in relation to the structural conditions of each project, rather than drawing direct comparisons without considering the context of the data collection.

Another factor that shapes the interpretation of consultation in the two cases is the professional roles and phases represented by the interviewees. In the Ängelholm–Maria case, most interviewees were involved in the early investigation phase and the design and implementation phase, stages where consultation tends to be more formalized and possibly seen as a completed requirement. In contrast, the Gothenburg–Trollhättan interviews primarily involved individuals active during the preliminary study and planning phase, when consultation is often a central and ongoing process. This means that consultation naturally emerged more frequently and with greater emphasis in the latter case. It is therefore important to recognize that the differing prominence of

consultation in the interview material may reflect when and how it was most relevant to the respondents, rather than its actual impact or scope in the projects. Although this makes direct comparisons more complex, it also highlights how approaches to consultation are shaped by the organizational and temporal context of each project phase.

6.1.2. Champions - Should the System Rely on Them?

A key insight from this study is that the issue of social sustainability in Swedish railway planning often lacks clear institutional anchoring. In practice, the advancement of the issue appears to largely depend on individual actors within authorities, consultancy firms, or municipalities who have chosen to champion it. The interview study revealed that dedicated individuals have, on their own initiative, formed informal networks to raise the profile of social sustainability. This supports Vanclay's (2003) description of SIA as a tool that, in the absence of institutional embedding, becomes dependent on proactive actors to identify and address social consequences.

Although individual expertise and engagement are crucial, Moulton et al. (2006) argue that individual competence alone is insufficient for long-term decision-making. They emphasize that sustainable decisions must be institutionalized through clear processes, guidelines, and defined responsibilities to ensure that decision-making is not solely dependent on individuals but supported by organizational mechanisms that guarantee continuity and long-term sustainability. Without such institutional support, an individual's competence or interest can significantly impact whether social dimensions are addressed, particularly during the planning phase of a project (Moulton et al., 2006). This makes the issue vulnerable, both because it can be overlooked in favor of economic or technical priorities, and because it often relies on personal commitment rather than systematic structures (Antonson & Levin, 2020). In addition, when those who actively champion and prioritize social sustainability efforts, often driving the integration of social considerations, leave their roles, or as projects progress to new phases, the focus on social sustainability is at risk of being overlooked (Moulton et al., 2006). This poses a significant challenge, as without a solid institutional foundation, social sustainability may be inconsistently prioritized, depending on the actors involved.

Kelling et al. (2021) argues that the state must have a clear strategy and institutional certainty to ensure the effective implementation of social sustainability. They emphasize that without a clear and stable institutional framework, where responsibilities and regulations are well-defined, uncertainty will lead to inefficiencies and inconsistent implementation of sustainability measures. This uncertainty not only affects the actions of state actors but also spreads to other stakeholders, resulting in uneven prioritization of social sustainability based on different actors' interpretations of responsibility (Kelling et al., 2021). In interviews with both the Specialist Landscape

Architect and the Program Coordinator for Planning and Social Perspectives at Trafikverket they emphasized that, while the agency formally holds the overarching responsibility for integrating social sustainability, there is often ambiguity regarding who within the organization is expected to lead and coordinate this work. This internal vagueness contributes to a situation where implementation relies heavily on the initiative of motivated individuals rather than being systematically embedded in project processes. This lack of clarity within organizations further worsens the challenges of integrating social sustainability, making it crucial for the state to not only define responsibilities clearly but also to institutionalize processes that ensure consistent and effective implementation across all levels.

Furthermore, there is also a risk that the social perspective may become overshadowed if it is only treated as a subset of broader sustainability goals. Without a corresponding development of requirements and operational tools for the social dimension, there is a significant risk that it will continue to be addressed superficially, as an "additional" concern rather than an equal counterpart. In turn, this could limit the real impact that social outcomes have on decision-making, despite ambitions to integrate the issue within a broader sustainability framework. Therefore, while individual champions remain important and often necessary to elevate the issue, their efforts must be matched with structural support. Without formal mandates, accountability mechanisms, and integration into institutional routines, social sustainability will struggle to gain the same influence as other more established planning dimensions. To ensure long-term impact, the responsibility for social outcomes must move from individual initiative to collective institutional commitment.

6.1.3. Social Sustainability Over Time

The comparative analysis between the two case studies and the developments described under section 5.6 *New Approaches for Social Sustainability* reveals a clear evolution in how social sustainability is addressed in Swedish railway planning. In the Gothenburg–Trollhättan project, which was planned and implemented in the early 2000s, social sustainability remained a peripheral concept. There was no common terminology, no methodological guidance, and social considerations were only marginally reflected in decision-making and evaluation processes. Instead, planning was dominated by traditional infrastructure priorities, with minimal engagement with broader community impacts.

In the more recent Ängelholm–Maria project, carried out in the 2020s, a shift can be observed. Social sustainability was more visible both in professional discourse and in planning documents, and was to some extent integrated into tools such as Trafikverket's Comprehensive Impact Assessment (SEB). Although formal requirements and systematic follow-up were still lacking, there was a stronger recognition of the issue,

and some actors took their own initiative to incorporate social dimensions such as safety, accessibility, and participation. While the work was still largely champion-driven, this indicates a move from marginality to semi-structured practice. This development resonates with Bramley and Power's (2010) argument that urban sustainability hinges on the ability to support social cohesion, inclusion, and long-term quality of life-principles that require institutional mechanisms for implementation, not just rhetorical commitment.

In the planning of the Gothenburg–Borås railway, as of 2025, a clear evolution in the treatment of social sustainability can be observed over just five years. Initially, social aspects were primarily addressed through standard consultations and impact assessments, often as separate components. However, the project has developed into a model for how social sustainability can be systematically integrated into Swedish infrastructure planning. Social considerations are treated as equally important as environmental and economic factors throughout the decision-making process. Tools like SIA have been used iteratively from early stages, supporting a shift from reactive to proactive and structured work. This development reflects both internal organizational learning and broader changes in how social sustainability is framed and operationalized within Trafikverket.

This shift in Swedish practice should be viewed within the broader context of international research on SIA. According to Antonson and Levin (2020), Sweden has previously lacked a formalized framework for integrating social sustainability into infrastructure planning. In line with the case studies and as described in the theoretical framework, Antonson and Levin (2020) revealed that social concerns were often limited. They observed a declining trend in attention to social aspects in planning documents over time, a troubling finding given the increased complexity and social stakes of modern infrastructure projects. In places like Australia, New Zealand, and South Africa SIA has become an institutionalized and often legally mandated component of the planning process (Antonson & Levin, 2020). In the light of the two cases covered in this thesis and findings regarding the Gothenburg-Borås project, the current situation in Sweden can best be described as a transitional phase. As Salet et al. (2012) highlight, complex infrastructure projects evolve over long timeframes and involve shifting coalitions of stakeholders and priorities. Our interviews under section *5.6 New Approaches for Social Sustainability* reflect both the complexity and the emerging momentum surrounding this issue. Practitioners describe a growing institutional awareness within Trafikverket, with efforts underway to improve internal guidance, adapt cost-benefit tools, and strengthen attention to local-level effects. While these developments are still uneven and often depend on individual initiative rather than formalized routines or policies, the overall outlook is optimistic. Several respondents emphasized that social sustainability, though still a relatively new concept, has gained notable traction in recent years and is since the last couple of years included in

Trafikverket's Comprehensive Impact Assessment. As one Senior Investigation Manager put it, the influence of social considerations in decision-making is "weak but growing", a sign that the topic is becoming increasingly integrated into infrastructure planning.

To summarize, the development of social sustainability in Swedish railway infrastructure can be understood as a slow but discernible transition, from marginal consideration in the early 2000s, to emerging recognition and ad hoc integration in the 2020s, and now toward a more structured, though still incomplete, institutionalization. Although the pace and consistency of this evolution remain uneven, the trend suggests increasing acknowledgment of the need for clear responsibilities, methodologies, and long-term frameworks to ensure that social sustainability becomes a stable and integrated part of infrastructure decision-making. However, Sweden still lags behind many international counterparts in embedding social sustainability into the fabric of infrastructure governance. The path forward requires not only methodological refinement and clearer accountability, but also a cultural shift within planning institutions, from viewing social issues as externalities to recognizing them as core performance criteria in public investment.

6.1.4. Contributions and Contradiction

This study confirms several of the core findings presented by Antonson and Levin (2020), particularly regarding the absence of established frameworks for systematically addressing social sustainability in transport infrastructure projects. As their research concluded, the lack of binding guidelines or standardized practices leads to significant variations in how social aspects are interpreted and integrated across projects. Our empirical material, including interviews and document analysis, supports this conclusion. The inconsistency in how social impacts are handled demonstrates that project outcomes are highly dependent on context, involved stakeholders, and individual initiatives. In this sense, our findings reinforce their argument and underline the continued relevance of the problem they identified. That our study arrives at similar conclusions strengthens the credibility of our results and suggests that the challenge remains unresolved. It highlights the ongoing need for institutional development and regulatory clarity to ensure that social sustainability is not left to chance or individual engagement, but is integrated systematically and equitably across projects.

However, our study also contributes new insights that extend the existing literature. Notably, our empirical material shows a strong emphasis on consultation and participatory processes in the way social sustainability is understood and practiced by professionals. Several interviewees described consultation as the main arena where social aspects are expressed and negotiated. This differs somewhat from the picture painted in earlier studies, where consultation is often treated as a formal requirement rather than a substantive driver of social sustainability outcomes.

Taken together, our study reinforces the problem of lacking frameworks but adds a layer of complexity by showing that, in the absence of formal structures, certain processes, such as consultation, may become disproportionately emphasized. This highlights the need not only for clearer responsibilities and methodologies, but also for a broader and more balanced understanding of what constitutes social sustainability in infrastructure development.

7. Conclusion

This study investigated how the construction of double tracks between larger and medium-sized cities in Sweden influences social sustainability, with a focus on decision-making processes and stakeholder dynamics. The analysis was based on the following research questions:

RQ1: *How does the construction of double tracks influence social sustainability, as assessed through defined impact categories such as demographic changes, access to social services, lifestyle and daily life, environmental related social effects, safety and crime, political influence and participation?*

RQ2: *What role do policymakers, transport agencies, contractors, and communities play in shaping decisions regarding social impact in railway development?*

RQ3: *How do approaches to decision-making regarding social impacts in the railway infrastructure industry range from reactive to proactive, and what factors influence this tendency?*

The questions were examined and answered through the study, leading to the following conclusions:

Answering Research Question 1:

The construction of double tracks influences social sustainability through multiple impact categories, such as accessibility, lifestyle and daily life, demographic changes, environmental-related social effects, safety, and participation. In both case studies, the double-track expansion led to improved regional connectivity, making commuting more efficient and thereby increasing access to employment, education, and services, particularly benefiting smaller towns by bridging distances to larger urban centers. This contributed to strengthened labor markets and enhanced everyday mobility, positively affecting lifestyle and quality of life.

At the same time, double-track expansions also brought social challenges, including increased noise exposure, the creation of physical barriers within urban environments, and limited opportunities for meaningful participation in planning processes. These impacts risk creating uneven outcomes for different groups, where some communities may experience deteriorating living environments or feel excluded from decisions that

affect their daily lives. Despite ambitions to contribute to more sustainable and inclusive transport systems, the assessment and prioritization of social aspects often appeared fragmented and were commonly guided by technical and economic considerations rather than by a comprehensive and systematic social impact assessment. This suggests that important social values risk being overshadowed in decision-making processes primarily driven by arguments of capacity and efficiency.

Thus, the influence of double-track expansions on social sustainability is both enabling and constraining, depending on how decision-making processes integrate and weigh social impact categories throughout planning, design, and implementation.

Answering Research Question 2:

Policymakers, transport agencies, contractors, and communities each play distinct roles in shaping decisions regarding social impacts in railway development, although their responsibilities often overlap and interact.

Policymakers set the overall direction by defining national transport strategies and approving infrastructure investment plans, such as the National Transport Plan. Through these instruments, they create the structural conditions that determine how, where, and why railway projects are prioritized. Their responsibility also includes ensuring that frameworks and regulations support the integration of social sustainability, for example by mandating or encouraging the use of social impact assessments (SIAs) and embedding social criteria into decision-making processes. However, as highlighted in this study, such frameworks are currently lacking in Sweden, which limits policymakers' ability to steer social sustainability systematically.

Transport agencies, particularly Trafikverket, are tasked with translating these strategic plans into concrete projects. Trafikverket holds a key operational role in ensuring that social sustainability considerations are integrated into project planning, design, and implementation. This includes leading stakeholder consultations, managing environmental and socio-economic assessments, and incorporating social concerns into project-specific decision-making tools, such as the Comprehensive Impact Assessment (SEB). Trafikverket also has the authority to shape tender requirements and influence how contractors address social impacts. However, the study reveals that social sustainability often remains under-prioritized in these processes, unless driven by strong individual advocates or specific local conditions.

Contractors primarily contribute during the design and construction phases and have the potential to influence social outcomes through their technical solutions, construction methods, and engagement with local communities. Their formal responsibilities are typically framed by contract specifications set by the client, in most

cases Trafikverket, which means their capacity to address social impacts depends heavily on the requirements and incentives included in procurement documents. Nevertheless, contractors can play a proactive role by proposing socially responsive solutions or engaging in dialogue with affected communities, although such initiatives often remain voluntary rather than systematically embedded in project frameworks.

Communities, including residents, businesses, and civil society organizations, play a crucial role by contributing local knowledge, highlighting social concerns, and advocating for community interests during consultations and other participatory processes. Their influence is primarily exercised through formal mechanisms, such as statutory consultations during the planning phase, but also through informal advocacy and dialogue. The study shows that while these processes create opportunities for input, communities often experience limited influence over final decisions, especially when social impacts are perceived as secondary to technical or economic priorities.

Overall, ensuring that social sustainability becomes a visible and prioritized part of railway development requires coordinated action from all these actors. While each stakeholder has specific responsibilities, the absence of clear frameworks and binding requirements for social considerations limits their collective capacity to systematically address social impacts. This underscores the need for both strategic leadership from policymakers and transport agencies, and for strengthening the mechanisms that enable contractors and communities to actively contribute to socially sustainable outcomes.

Answering Research Question 3:

The study shows that decision-making regarding social impacts in railway infrastructure projects remains largely reactive. Social aspects are seldom integrated from the outset but tend to be addressed when they emerge as concerns during consultation processes or are raised by specific actors. In several cases, socially beneficial outcomes were achieved not through deliberate strategies but as side effects of responding to emerging issues or adapting to contextual conditions, such as the use of digital consultations, broadening participation or design changes following safety-related feedback from local stakeholders.

These findings suggest that while opportunities for supporting social sustainability can arise throughout the project lifecycle, the absence of systematic frameworks and early integration limits the potential for proactive handling of social impacts. Instead, decisions are often driven by technical and economic priorities, with social considerations entering the process primarily as risk management or through stakeholder pressure. To move toward more proactive and anticipatory approaches, there is a need for stronger institutional support, clearer guidelines, and early, structured consideration of social impacts in project planning and design.

Underlying this reactive tendency are several systemic factors, including the absence of formalized requirements for social impact assessment, the dominance of technical and economic considerations in decision-making frameworks, and organizational cultures where social sustainability is often seen as peripheral rather than integral to project value. While there are signs of evolving awareness and experimentation with more socially responsive practices, these remain largely dependent on local conditions, individual initiative, or unforeseen circumstances, rather than being institutionalized as standard practice.

Overall, the current approach to decision-making on social impacts can be characterized as reactive rather than proactive, where learning occurs through experience rather than through structured foresight and planning. For more proactive approaches to take root, stronger frameworks, clearer mandates, and more deliberate integration of social perspectives into all phases of project development would be required.

7.1. Suggestions for Further Studies

To advance understanding and support more socially sustainable infrastructure development, future research could explore the following questions:

- *How can existing planning legislation or internal guidelines be reformed to more explicitly incorporate social impact categories throughout the project lifecycle?*
- *How do politicians and elected officials understand and prioritise social sustainability in the context of infrastructure investment decisions?*
- *What types of decision-making tools or support materials could enhance the integration of social sustainability in infrastructure planning by public authorities?*
- *How can consultation practices in the railway infrastructure sector be developed to achieve higher levels of participation, as defined by Arnstein's Ladder, and be recognised as a core method for promoting social sustainability rather than a procedural formality?*
- *How do double-track railway projects affect social sustainability over time, particularly in terms of demographic shifts, community well-being, and local economic change?*

Answering these questions would help build a stronger evidence base for integrating social sustainability into the early stages of infrastructure planning and improve decision-making for future transport investments.

7.1.1. Recommendations for Key Stakeholders

Based on our study, we conclude that double-track railway expansions have the potential to contribute to important social benefits such as improved accessibility, safety, and regional connectivity. However, our findings suggest that these outcomes are not always the result of systematic planning, but can also emerge through practical responses to specific situations or stakeholder input. To enhance the integration of social sustainability in future projects, we present the following recommendations directed at Trafikverket and Crabat AB. These suggestions aim to support both organizations in strengthening their strategic, procedural, and practical approaches to social impacts in railway infrastructure projects.

Recommendations to Trafikverket

- **Establish binding national guidelines for Social Impact Assessment (SIA)**
  Sweden currently lacks a formalized framework for SIA in transport infrastructure. Trafikverket should take a leading role in developing and implementing standardized, binding guidelines for SIA to be used in all major infrastructure projects. These guidelines should include clear expectations on data collection, stakeholder engagement, and follow-up of social impacts.
- **Mandate the integration of social criteria into project prioritization tools**
  To move beyond symbolic consideration of social aspects, Trafikverket should require that all comprehensive impact assessments (SEB), cost-benefit analyses (CBA), and early planning documents explicitly account for social sustainability. This includes quantifiable social indicators such as access to services, participation levels, and perceived safety.

Recommendations to Crabat AB

- **Strengthen internal methodologies and actively prioritize projects with a clear social sustainability dimension**
  By incorporating social sustainability as a key consideration in project selection and business development, Crabat can take a more strategic role in steering its project portfolio toward projects where social impacts are significant and where the firm can contribute to socially responsible outcomes. This also entails critically evaluating and potentially declining projects where social sustainability is not prioritized or where the potential to contribute meaningfully is limited.
- **Build competence and capacity on social sustainability within the organization**
  Invest in developing internal knowledge and skills related to social sustainability and social impact assessment, enabling Crabat to take a stronger role in promoting socially sustainable practices throughout project lifecycles.

- **Set a minimum standard for participatory practices in consultancy assignments**
  Crabat should adopt a policy that all relevant projects include at least a baseline level of stakeholder participation, aiming for level 5 or above on Arnstein's Ladder of Participation, which would be one step higher than what is perceived as necessary according to current Swedish regulations. For example, Crabat could provide clients with structured participation guidance, including templates for planning stakeholder engagement, checklists to evaluate participation quality (e.g., inclusivity, influence, transparency), and standardized reporting formats. These tools would help ensure that participatory processes are purposeful, traceable, and aligned with best practices such as Arnstein's Ladder of Participation.

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Appendix

Appendix 1. Interview template

Category	Question
SOCIAL SUSTAINABILITY	1. To what extent do you think social sustainability has been included in the case project?
	2. Are there clear methods for how you are supposed to work with social sustainability? a) Why were social sustainability measures included in the project, and who initiated them?
	3. How would you define social sustainability? How do you understand the concept? a) Is social sustainability as important as economic and environmental sustainability?
	4. What do you think is the most important aspect of social sustainability?
DECISION - MAKING	5. Which stakeholder(s) are responsible for driving the development of social sustainability?
	6. How does the consultation report affect the decision-making process in the project?
	7. Do you see any concrete obstacles to social sustainability in railway projects?
CONCLUDING	8. In other projects you have worked on – do you work with social sustainability in a way that differs from how it was handled in the case project? Why?
	9. What are the most significant social changes observed in cities after railway expansions?

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