

A Resilience Perspective on Governance for Construction Project Delivery

Nils. O.E. Olsson¹ and Ole Jonny Klakegg²

¹ Norwegian university of science and technology, Department of Mechanical and Industrial Engineering

² Norwegian university of science and technology, Department of Civil and Environmental Engineering

1. Introduction

The purpose of this chapter is to discuss project governance from a resilience perspective. We argue that resilience is a key aspect of project governance, and that project governance is a key tool for project resilience. We will discuss the resilience of projects and implications on project governance seen from different project actor perspectives. To do so, we will revisit a selection of railway cases in Norway.

Governance is used in many contexts and on different levels, including the private and public sectors. According to Robichau (2011), the term *governance* is ambiguous, and an agreed definition seems unlikely. In spite of this, the concept is interesting. In this chapter, our main focus is on governance in the public sector, but we draw on some experiences from the private sector as well. Public governance refers to the formal and informal arrangements that determine how public decisions are made and how public actions are carried out, from the perspective of maintaining a country's constitutional values when facing changing problems and environments.

Project governance also has many definitions. In this chapter, we define project governance as: 'a process-oriented system by which projects are strategically directed, integratively managed, and holistically controlled, in an entrepreneurial and reflected way, appropriate to the singular, time-wise limited, interdisciplinary, and complex context of projects.' (Renz 2007, p. 19). Project governance is of special importance for construction project organising

because the project level is 'the proof of the pudding', where governance on all levels meet in actual execution.

Project governance can be further divided in several aspects. One aspect is the governance *of* projects, understood as governance on the asset owners' side, to make sure that the organisation selects the right projects and align projects with organisational strategic goals. Governance *in* projects, on the other side, is where governance means are implemented within the project organisation to secure successful delivery and efficiency in the use of project resources. In multi-organisational teams, governance may also relate to the ownership of the resources that belong to each single organisation and which are used in the project – a subset of corporate governance. It is descriptive of the fact that every team or individual hired into a project is part of an organisation that has its ownership elsewhere (the consultancy, contractor or other supplier firm). This governance aspect concerns ownership to resources, not ownership to the project goals, even though there is a link through risk allocation in contracts. Together, these aspects of governance make up a complex totality. From a resilience perspective, they all need to be addressed.

Resilience is addressed in many scientific areas with different meanings. In technology, it may mean 'bouncing back', such as in material science where resilience is the ability of a material to absorb energy when it is deformed elastically. In business, it can be the positive ability of a system or company to adapt itself to the consequences of a catastrophic failure. This means that resilience can be related to survival. However, in a governance perspective, it is interesting to ask; survival of whom or what? What unit shall survive? And for what purpose?

In the governance of projects, the survival of individual projects may not be the overall objective. In a corporate governance perspective, it is typically the permanent organisation that is the focus object, or the institution as discussed by Söderlund and Sydow (2019). The concept of strategy is important in governance, and the relationship between the organisation and its projects is often discussed. Artto et al. (2008), for example, highlighted the importance of the project's independence from the owner and the strong stakeholder organisations to succeed. If a project becomes misaligned with overall organisational objectives, the survival of the organisation may require adjustments, or even cancellations of

individual projects, or possibly rearrangement of the business ecosystem, which form the project context. In this sense, resilience may also be about keeping the project context stable enough to make delivery possible.

From a theoretical perspective, this chapter aims to add a new perspective on governance by focusing on the concept of resilience in a project governance context. We then provide examples of how this has been done in selected railway cases. Key research questions of the chapter are the following:

- What can resilience mean to project governance in different project phases, and seen from different project stakeholders?
- How can the concept of resilience add knowledge and perspective on project governance?

In the following, we give a brief overview of some previous project governance work, followed by a presentation of selected perspectives on resilience in general and what resilience can mean to project management and governance. Following this, we present four Norwegian railway project cases and what survival can mean to such projects. Our focus will be on high-level governance rather than the governance of day-to-day project operations, and we study projects mainly from a client perspective, even though we include interaction between the client and contractors. Finally, we propose a model for perspectives on resilience in different project phases and institutional levels and use it to discuss our results.

2. Theoretical Background

2.1. Governance

Governance has been an interest to researchers and practitioners for some time, including studies of power structures in government (Stoker 1998). Later, it has developed into a field of study where the focus is on how influence is happening – in society and organisations (Pierre and Peters 2000). Literature on governance often focuses on macro-perspectives at national and regional levels or corporate governance covering private sector organisations. There has also been significant research on governance in the public sector and even the

third (not for profit) sector (Phillips and Smith 2011). Of special importance is the project level, and governance of and in projects has become a major part of project management studies over the last 20 years (Miller and Lessard 2000; Pryke 2005; Crawford et al. 2008; Klakegg et al. 2008; Klakegg and Olsson 2010; Ahola et al. 2014; Müller 2017; Unterhitzberger and Moeller 2021).

The UK Association for Project Management (APM) defines the governance of project management as ‘those areas of corporate governance that are specifically related to project activities. Effective governance of project management ensures that an organisation's project portfolio is aligned to the organisation's objectives, is delivered efficiently and is sustainable’ (APM 2011, p. 7). This approach to project governance focuses on the way the corporation ensures that project managers and project organisations succeed in supporting the strategic goals of the organisation. This concept is more open to the influence of leadership and the effort of management than the general project governance literature, which often focuses on the structural means and system perspectives. Müller (2017) highlights that it is relevant to view governance as a system of controls, as processes, and as relationships.

2.2. Resilience in Different Research Areas

The term resilience has been used in different ways, and in several scientific areas. In ecosystems, Holling and Gunderson (2002) state that ecosystem resilience is the ability to absorb disturbance without inducing ‘system changes’. In psychology and health science (Herrman et al. 2011), as well as human development/behavioural science (Masten et al. 2009), resilience is related to positive adaptation in the context of significant challenges. Similarly, in social-ecological systems, Cinner and Barnes (2019) write about resilience as the capacity to tolerate, manage, and adjust to changing social or environmental conditions while retaining key elements of structure, function, and identity. Related to socio-technical systems, Ruth and Goessling-Reisemann (2019) point out that while resilience is typically perceived as desirable, resilience may also hinder development, when change is desired. In those situations, resilience may become counterproductive.

In decision-making, Grafton et al. (2019) discuss resilience management as planning and adaptation actions that influence social-ecological system characteristics. They further elaborate on social-economic resilience, including issues such as resilience of what objects (system, system component or interaction) are being managed and for whom resilience is being managed.

A general summary from a review of publications on resilience is as follows:

- There are several papers on risk management and crisis and disaster management.
- There are many different areas of application: health and safety, environment, natural hazards, climate change, job security, and career development.
- There are some that focus on information systems, organisational change, human factors, and stakeholder participation.

In the following, we will move from reviewing resilience in different scientific areas to be more specific on project management.

2.3. Resilience in Projects

In projects, Rahi (2019) proposes a conceptual framework of project resilience to evaluate the ability of projects to deal with disruptive events and enhance their resilience. Further, Rahi (2019, p. 74) refers to Geambasu (2011, p. 133) as ‘the first to introduce the concept of project resilience after an empirical study on major infrastructure projects. The author defines it as “1) the project system's ability to restore capacity and continuously adapt to changes 2) to fulfil its objectives in order to continue to function at its fullest possible extent, in spite of threatening critical events”.’

Turner and Kutsch (2015) relate resilience to how projects evolve and realign to be able to face disruptive events. Similar perspectives have been researched in projects using the term early warning signs (Hajikazemi et al. 2015). Further to this, Crawford et al. (2013) look at disaster management and projects, while in project risk management, Sabbag (2020) highlights the human factor in project resilience.

2.4. Resilience and Flexibility

We noted two schools of resilience definitions and elaborations from our literature review. One school focused on the returning to the original state of a system (such as an ecosystem or organisation). This seems to be based on the (often implicit) assumption that the original state was in equilibrium, optimal, or at least desirable. The other resilience school opens for the flexibility of the system as a means of survival, and resilience does not necessarily mean to strive for the return to exactly the original situation. From this, we summarise that resilience involves finding a new way forward.

The terms flexibility and resilience share several characteristics. Both are responses to the shock or impulses that reside within uncertainty. However, there are also differences. Many, though not all, definitions and elaborations on resilience tend to highlight the desire to return to the situation before the system was exposed to shock. In a project management context, this is illustrated by for example Kutsch et al. (2015), where incidents drive projects off track, causing deviations and poor project performance. If corrective actions are not taken, projects may not survive, i.e. being terminated. It is a tendency in the project resilience literature to indicate that the objective of such corrective action is to return to the plan. As a potential alternative, flexibility represents a strategy in projects to adapt to changes (Olsson 2006), which is a critical part of project organising and formal re-organisation for execution. Flexibility can also increase the value of a project. This means that flexibility does not necessarily aim at returning to the original plan, but to work on an adjusted plan, and can aim at an improved project objective. This improved plan represents added value that may manifest as improved quality, added benefits, learning, and new best practice. Figure 6.1 illustrates this. As pointed out by Cooper (2014) and Szentes and Eriksson (2016), flexibility is a key characteristic of successful project organisation from the front end and onwards, but the foundation for such organisational flexibility is laid in the front end.

Figure 6.1 illustrates that the concepts of resilience and flexibility as used in this chapter are both related to how an organisation responds to a shock or change induced stress. The general understanding of resilience focusses on the ability to survive the shock and get back on its feet; flexibility includes the potential to use the current situation (the shock) as leverage to do something positive.

3. Reflections on Project Governance, Resilience, and Survival

As shown in previous sections, the resilience concept is used in a wide array of disciplines, including project management, and the understanding of the concept points to resilience as related to survival, recovering from damaging impact and coping with stress. In a project management context, damaging impact can be issues such as new project pre-requisites related to, for example, funding, stakeholder priorities, new policies or strategies, or other issues that cause major changes in context or objectives, or the effects of poor estimates, inadequate project preparations, or critical accidents.

Projects are temporary by definition, and they have a defined life cycle. Temporary project organisations are established and then dissolved when the project delivers its result to mainstream operations in house, or the client or owner where provision is outsourced. Related to concepts of resilience, this is different from most management literature where the studied organisations are typically defined as permanent. In fact, much of the resilience thinking is about avoiding organisations being temporary, to secure organisational survival.

Project resilience can be seen through both a wide and narrow perspective. A wide perspective includes different types of adoption. As for project survival, resilience then looks similar to the practice described by Miller and Lessard (2000), where projects are shaped in episodes or stages. Project plans and their execution are adapted to new pre-requisites or moving goals. Governance in this perspective typically includes conceptually questioning the project and realigning the project with new realities. Resilience will be the characteristic of organisations and project actors that are able to innovate, transform, and create new futures as the context of the project changes. The narrow perspective is related to project delivery, where resilience is the ability to deliver a project on time and budget, with limited change of scope despite disruptions.

We will in the following analyses and discussion stick to survival as the purpose of resilience. Survival, however, may also be understood in different ways. Inspired by Davidson (2020), we suggest the immediate – survive the blast (survival), the secondary –

getting back on your feet (adaptation), and third – find another, potentially better, future (transformation).

From a governance perspective, Grafton et al. (2019) ask a number of relevant questions, including survival of whom? What unit shall survive? Related to project governance, some alternative perspectives on this may be:

- the project manager (career)
- the project (the purpose of the intervention)
- the programme (consisting of several projects)
- the organisation (including its portfolio of projects and business as usual)
- the ecosystem/project context/surroundings (the environment or society)

Projects are intentional interventions to change (improve) the client organisation's position in society and business. In case of a shock to the organisation as a system, the project is not given. Projects may be adjusted, delayed, postponed, or even cancelled, depending on the contractual status, if it is for a greater good, such as the survival of the organisation. Our following study will focus on the client organisation, which for railways typically is the infrastructure management organisation. At a programme or portfolio level, projects may be changed or cancelled if the project is revised for a range of reasons. Such adjustments may be triggered by political decisions, policy changes, economic shifts, or other influences, often rooted well outside the projects themselves.

Based on the initial literature study and these reflections, we define the analytical framework, as follows. In line with Cinner and Barnes (2019), we adopt the understanding that resilience is the capacity to tolerate, absorb, cope with, and adjust to change, with a focus on survival.

We will look for answers to the following questions:

- Survival of whom? (key actors).
- Adaptation to what? (key sources of disturbance and stress).
- Transformation of what? (necessary changes and their intended outcome).

In the following paragraphs, we will look into some practical, real-life examples of cases and situations where these questions become relevant.

4. Project Cases and Implications on Governance

The issues discussed in this chapter are illustrated with four cases from railway projects in Norway. We look at ‘before’ decision to finance, ‘after’ such decision, and the non-survival of the project. We chose railway projects because they illustrate a challenging governance situation for large public projects. Railway investments are large and have long time horizons. They also involve safety-critical systems, and the organisations involved, thus, often need different types of safety-related licences. Railway projects are typically high profile with many stakeholders, including enthusiasts who promote this transport mode. In the cases presented in the following sections, we illustrate examples of resilience and survival and its relationship with governance in the context of the overall railway organisational structure in Norway.

The railway sector in Norway has been through a stepwise new public management inspired split up (Ryggvik 2016). The former public enterprise Norges Statsbaner (NSB) was split into a train operator, an infrastructure manager (now called ‘Bane NOR’), and a safety inspectorate in 1996. A further split up of the railway sector was effective from 2017. Competitive bidding for subsidised traffic is ongoing, and new train operators have entered both the freight and passenger markets. In terms of governance, railway and other transport modes sit under the Ministry of Transport, and a new Railway Directorate serves as an interface between the ministry and Bane NOR.

4.1. Before Decision – Staying Alive Long Enough to Get Funding

4.1.1. Nord-Norge Line

The Northern Norway line is a proposed extension of the Nordland line to the north from Fauske to connect to the Ofot line in Narvik and continuation to Tromsø and a possible sideline to Harstad. The line will pass challenging geography with high mountains and deep fjords, and there are few urban settlements along the line. The idea of linking northern Norway with the rest of the country has been on the table since the late nineteenth century. When looking at a railway map of Scandinavia, the possible line appears as an obvious missing link.

There have been several conceptual studies of Nord-Norge line, including reports in 1982, 1992, 2011, and 2019. Recently, the line has received considerable attention again on the political level. In 2019, the Norwegian Railway Directorate presented an analysis that estimated the costs of a fully developed line at around NOK 130 billion (13 billion Euro) and concluded that it will probably not be socio-economically profitable (Jernbanedirektoratet 2019). Following this initiative, a wider consideration of the whole transport system in the north of Norway is underway, including the option to build the Nord-Norge line.

Organisational level:

- Survival of whom? The responsible agency Bane NOR.
- Adaptation to what? Pressure from strong promoters to deliver a railway, despite not being a social-economic viable solution.
- Transformation of what? The transport system in northern Norway – and in the perspective of this chapter the railway system in particular.

Project level:

- Survival of whom? Economic actors in northern Norway.
- Adaptation to what? Need for economic stimulus to develop the region.
- Transformation of what? Economic drivers in the region by adding new investments in infrastructure.

The idea has proved remarkably resilient over a century, and particularly over the last four decades, surviving the reorganisations of the railway sector. If history repeats itself, the line may eventually be built if the idea survives long enough.

4.2. After Decision – Staying Relevant and Delivery Through Execution

4.2.1. Venjar-Langset

The ongoing railway project Venjar-Langset north of Oslo expands existing double track sections by converting a singletrack line to a double track (Bane NOR 2021). The total cost of the project is approximately 7 billion NOK (0.7 billion Euro). The project includes several

complex technical components, of which the Minnevikka bridge is of particular interest in this story as it will become Norway's longest railway bridge at 836 m.

To illustrate the resilience in the execution phase, we focus on how the project handled the COVID-19 situation. The contractor with responsibility for building the Minnevikka bridge is an international contractor with all its workforce based in other countries in Europe. When COVID-19 hit and travelling between countries became banned, the contractor faced immediate and severe consequences. For the project, this was a real and emergent crisis. Without special provisions, the contractor would have no chance of delivering as planned and according to contract. Bane NOR, as the client, understood they needed to actively help the contractor to achieve exemptions from the general ban on travel across borders.

Bane NOR decided to negotiate with the authorities to gain acceptance for solutions that were in line with COVID-19 regulations for society critical personnel for inbound travel. At potential risk for being held accountable in the media and on a political level for any coronavirus outbreak connected to the project, Bane NOR chose to go the extra mile to help their contractor. All rules for testing against coronavirus, such as a quarantine period upon arrival, had to be followed. Bane NOR as client accepted the time and cost risk for these extra provisions to make sure that the contractor was able to keep up the progress, and thus, the possibility for successful delivery was kept alive.

Organisational level:

- Survival of whom? The contractor, and the reputation of Bane NOR as responsible owner.
- Adaptation to what? COVID-19 pandemic restrictions on travel and transport.
- Transformation of what? Priorities and procedures for transport of materials, equipment, and staff across borders.

Project level:

- Survival of whom? Key roles held by individuals in client and contractor organisations.
- Adaptation to what? Lack of materials, equipment, and staff due to travel and transport restrictions.

- Transformation of what? Time and cost risk to cover extra project procedures and work conditions.

In hindsight, the measures have proven successful despite the client having to accommodate extra costs and some delays. The contractor has kept all regulations and personnel, and materials and equipment have been able to cross borders. The procedures for inbound travel have worked, and the contractor is still on plan for successful delivery.

4.2.2. Gardermoen Line

The construction of the Gardermoen line was an integrated part of the decision to build Oslo's new airport Gardermoen, to have an Airport Express train from Oslo to the new airport (Olsson 2006). The line is not only used by the Airport Express trains, but also regional, long-distance, and some local trains. A separate company (NSB Gardermobanen AS) was established in 1992 to plan and build the new line. It was an objective of the Gardermoen line that the Airport Express train should have 50% market share of personnel transport to and from the airport (Government 1991). The airport and new railway line opened in 1998. The Airport Express train had a market share of 33% (JBV Utredning 2004), which is high by international standards. The operation is very reliable with a consistently better performance than other Norwegian trains. The market share for Airport Express trains has recently decreased, because more travellers use other trains on the Gardermoen line to get to the airport. However, The Gardermoen line serves its purpose as a climate-friendly transport alternative and has highly satisfied users.

The decision to integrate the railway line as a part of the airport was key to understand its rapid planning and decision process. The airport was not subject to question; Oslo and Norway needed a new central airport. The railway was more controversial, so by linking the two investments (the airport and the Gardermoen line), the approval of the railway investment was secured.

During construction, the Gardermoen line suffered from severe cost overruns. One reason was connecting the new line to the existing national railway system (a major change to the project that opened up greater benefits). Other reasons included water leaks in a long tunnel and a safety crisis due to the use of poisonous chemicals as a consequence of efforts to

seal the leaks. Shortly after its completion, the infrastructure (and related department) was transferred to the governmental infrastructure manager, and the company NSB Gardermobanen was continued as a railway undertaking, renamed to Flytoget and operating the Airport Express trains.

Organisational level:

- Survival of whom? The responsible company (NSB Gardermobanen AS).
- Adaptation to what? Political pressure to contribute to the wider railway network and transport system in society, and to open the same day as the airport.
- Transformation of what? Area of responsibility, business model, and organisational structure of the company.

Project level:

- Survival of whom? The responsible company (NSB Gardermobanen AS).
- Adaptation to what? Serious technical problems causing delay and cost escalation.
- Transformation of what? Plans, working conditions and organisational structure. The Government had to bail out the company by financing most of the extra cost.

As a railway line in operation, the Gardermoen line has shown great results. The Airport Express trains have better punctuality (between 92% and 97%) than other train services and significantly better customer satisfaction, being best in Norway for several years (Flytogets [2019](#)).

4.3. Non-Survival of Norwegian Railway Projects

4.3.1. High-Speed Railway

High-speed railway has been discussed in Norway for some time. In September 2010, the Railway authority (Jernbaneverket at the time) awarded several contracts for the evaluation of Norwegian long-distance high-speed routes. A final report was submitted in 2012 (Jernbaneverket [2012](#)). The report advised against building long-distance high-speed lines in Norway. A realistic cost estimate (of 1 trillion NOK, or 0.1 trillion Euro) was one of the key reasons for the conclusion. The conclusion paved the way for refocusing Norwegian railway planning, to direct investments for expanding the double track sections further out from Oslo.

These expansions, known as InterCity, could be seen as an initial step towards future high-speed investments.

Organisational level:

- Survival of whom? The responsible agency (Bane NOR – previously Jernbaneverket).
- Adaptation to what? Pressure from promoters of railway as a sustainable alternative to air traffic on one hand and the economic realities on the other hand.
- Transformation of what? The priorities among transport modes – potential shift to support railway and reduce air transport.

Project level:

- Survival of whom? Promoting organisations.
- Adaptation to what? Solid documentation that the high-speed railway idea was not viable as a solution for most of the Norwegian transport system and geographical area.
- Transformation of what? The business model of promoting organisations, the scope of transport to be included, and the geographical area.

This case illustrates the resilience concept very well. The original idea of a high-speed railway network in Norway was alive for a long time supported by climate change arguments and ambitions to revolutionise passenger transport in Norway. When the final blow came in the form of solid documentation that this was uneconomic, the idea was developed into promoting potentially more realistic, but still important railway investments.

5. Discussion

5.1. Different Approaches to Resilience in Different Project Phases

To summarise our observations, we make a distinction between the organisational perspective as well as governance *of* and governance *in* projects and use a simplified project life cycle with three phases – Before decision, Execution and Operation – as shown in Table 6.1.

The governance of projects before a final funding decision is focused on ensuring that it is the right project to be funded, and that the project is based on the right concept. This is well known in the front-end management of projects and project portfolio management. However, in a governance of projects perspective, resilience, such as survival of all project ideas, is not necessarily positive or desirable from the view of the project owner. The corporate governance perspective illustrates the organisational level that focuses on the survival and development of the organisation and the role of the resource owner (either at client or supplier side). Before projects are finally decided upon, governance in projects will be focused on securing funding and support for the particular projects.

During execution, the owner perspective on resilience focuses upon keeping the project in line with strategies and goals for the permanent organisation. Projects that drift off from the path or do not adjust when goals are changed become undesirable and, thus, potentially require the client to import new risks. The project perspective on resilience is keeping focus on delivering the predefined goals. This is referred to as *governance* in projects in Table 6.1. However, this can become adjusted to deliver on moving targets as referred to in the governance of projects in Table 6.1. This expresses a key point about resilience – projects need to be flexible and resilient in the face of a changing environment.

5.2. Reflections on the Norwegian Railway Cases

For both the Nord-Norge line and Norwegian high-speed railway lines project governance prior to funding includes questioning the viability of the project, while there is pressure from those who do not need to pay to keep the idea of the project alive. Domestic high-speed lines have not been a hot topic since the high-speed evaluation of 2012, but the work did serve as a trigger for the InterCity project. The death of one project paved the way for another, even though the InterCity project was recently put on hold due to cost escalations.

The Gardermoen line illustrates other aspects of project resilience. A controversial and expensive investment was brought through to realisation. The Gardermoen case demonstrated Gardermobanen's ability to bounce back from severe overrun in execution. The legal entity NSB Gardermobanen AS would have been bankrupt had it not been relieved of its debt, but the construction project survived long enough to be finished, and in operation

it is still a success story. Of the studied railway projects, Gardermobanen is the only case where we can study operational experiences. Related to governance in projects, the Airport Express train has been commercially successful after the financial restructuring. As for the governance of the Gardermobanen in operation, it has served as a major inspiration for the Norwegian railway sector, being the first high-speed line with good operational performance. The project also provided important learning for following railway projects (Ryggvik 2016).

The recent case of Venjar-Langset illustrates how the parties needed to collaborate to handle the crisis and keep the project on track during hardship that no one had imagined before the project started. The story illustrates how resilience is not the result of one actor's preparations and responses, but the result of joint effort and actions that depended on tough decisions on both sides of the contract (and the national authorities). Crisis looks different from different angles, responses depend on many parties, and the consequences (appropriate allocation of risk) must be shared fairly among the involved parties. Mutual respect, understanding, and information sharing also support the ability to detect, interpret, and respond to changes and shocks. This creates resilience and, thus, survival in execution.

In relation to Figure 6.1, we noted that flexibility and resilience share several characteristics, but there are also differences. In a governance perspective, organising a project is an important process from the front end. However, we find that the surviving railway projects also had the ability to take advantage of contextual changes. The surviving projects not only strived to be resilient in the meaning of returning to plan but were flexible enough to develop new organisational structures. This was the case for Gardermobanen in particular but also to the Nord-Norge line. This points to the need for governance to be flexible when faced with shocks, and this flexibility in governance, in turn, enables the project to be resilient and survive.

The Venjar-Langset project had established a governance structure that served the project well when it was challenged by the COVID-19 situation. This highlights the general importance of the front end, and that organising is an important process in the front end to build a platform for resilience and survival.

6. Conclusions

We have looked at the described cases through governance and resilience lenses. In particular, we have used the metaphor of survival as our fundamental interpretation of resilience and its relationship to corporate governance and governance *of* and *in* the projects. Our first research question was what resilience can mean to project governance in general, in different project phases, and seen from different project stakeholders (internal and external).

We found that survival can mean different things for both organisations and projects in different phases, and in different perspectives. It is not obvious that the survival of a project is the overall objective in the governance of projects; good governance can kill projects for the greater good of the organisation. However, we also saw in the studied projects that there was a strong drive to keep projects alive. Resilience was shown to include the possibility of simply being strong and persistent in the face of resistance, or completely the opposite – to be flexible to an extent that includes not only changing its structure, business model, or risk allocation, but in some cases even the project identity.

The concept of project resilience has many organisational aspects, including who is responsible, who defines strategies, and who brings them into life. The basis for resilience includes formally defining what decision-making arenas and entities are legitimate, together with relevant requirements for documentation. In Norway, these are highly centralised political and administrative structures. Accommodating for the public input and influences is regulated in the planning legislation. Process resilience depends on who is allowed to influence decisions, on what levels and at what stages, formally and informally. Transparency is one of the strongest means of building resilience.

The second question asked is related to how the concept of resilience can add knowledge and perspective on project governance. We found that resilience is different as seen with a focus on process, on output or outcome. The disparity is more than the difference in time perspective:

- Focusing on the *process* gives resilience a ‘here and now’ nature close to early warning signs (ability to detect and interpret signs), risk management (ability to avoid, correct, or live with risk), or even crisis management (the art of intuitively doing the right thing).

- Focusing on *output* gives resilience a nature that is directed at delivery of predefined results and goals that lie in the immediate future under the project's control. This includes project planning and control (the art of systematic balancing resources and goal-directed activity), and the ability to keep the context stable enough to let the project succeed.
- Focusing on *outcome* gives resilience its most fundamental nature – about survival in the long run. Most research on resilience has this focus and looks at ecosystems, open socio-economic technical systems, and other phenomena without time limits, but with identifiable thresholds where the shock may become beyond repair. Projects have this perspective as well, but as temporary interventions to create value and make improvements that last. The object of survival may not be the projects themselves, but the organisations and stakeholders that benefit from projects.

The general organisational structure of the Norwegian railway sector has been in a more or less constant flux in the period of the studied projects, from an integrated railway organisation prior to 1996, to the highly fragmented situation at the time of writing. It may be argued that the fragmentation gives one sort of flexibility and resilience by limiting responsibilities and influence – there are interfaces that can take up some forces and shelter other parts of the system. Each unit specialises and learns to live with its limited, but clear mandate. On the other hand, the use of a rather fragmented structure also points out each unit as responsible and requiring effort to stay and prove itself accountable. So, in this perspective, it seems the system becomes less flexible and less resilient.

This triggers more general questions about what really happens in social–technical–economic systems when the structure gets changed: When there are more interfaces, and the requirements across those interfaces are stricter than the ‘all for one and one for all’ monolithic structure and culture it came from in the 1900s – does it make the system more – or less – resilient? The signals found in the case stories above are not conclusive. The answer can possibly be both.

Value creation in the long run might represent much stronger incentives for prioritising capability building and strengthening reputation (building resilience), than short-term financial gain from quick fixes and immediate transactions (firefighting). We hope to have

illustrated that resilience adds an interesting perspective on project governance and construction project organising more generally. When it comes to survival, project governance may have the objective of project survival, but it may also include the questioning of individual projects.

References

Ahola, T; Ruuska, I.; Artto, K. and Kujala, J., (2014). What is project governance and what are its origins? *International Journal of Project Management*, 32(3), pp. 1321-1332

APM, (2011). *Directing Change; a Guide to Governance of Project Management*. Association for Project Management. Princes Risborough, UK. 2nd edition.

Artto, K.; Kujala, J.; Dietrich, P.; and Martinsuo, M., (2008). What is project strategy? *International Journal of Project Management*, 26(1), pp. 4-12.

Bane NOR, (2021). Venjar-Langset project: <https://http://www.banenor.no/eidsvoll> last accessed December 30, 2021.

Cinner, J.E. and Barnes, M.L., (2019). Social dimensions of resilience in social-ecological systems. *One Earth*, 1(1), pp. 51-56.

Cooper, R.G., (2014). What's next?: After stage-gate. *Research-Technology Management*, 57(1), pp. 20-31.

Crawford L, Cooke-Davies T, Hobbs B, Labuschagne L, Remington K, Chen P., (2008). Governance and support in the sponsoring of projects and programs. *Project Management Journal*, 39(1), pp. 43-55.

Crawford, L.; Langston, C.; Bajracharya, B., (2013). Participatory project management for improved disaster resilience. *International Journal of Disaster Resilience in the Built Environment*, 4(3), pp. 317-333.

Davidson, D.J. (2010) The Applicability of the Concept of Resilience to Social Systems: Some Sources of Optimism and Nagging Doubts, *Society & Natural Resources*, 23(12), pp 1135-1149

Flytoget (2019). Servicekvalitet i Flytoget 2019. <https://flytoget.no/globalassets/rapporter/servicekvalitet/rapport-for-servicekvalitet-2019.pdf> Last accessed March 13, 2022

Geambasu, G., (2011). Expect the Unexpected: An Exploratory Study on the Conditions and Factors Driving the Resilience of Infrastructure Projects. PhD Thesis: École Polytechnique Fédérale de Lausanne, Switzerland, Lausanne.

Government, (1991). St.prp. nr 90 1991-92 [New Main Airport for Oslo at Gardermoen] Ministry of Transport.

Grafton, R.Q., Doyen, L., Béné, C. et al. (2019). Realizing resilience for decision-making. *Nature Sustainability*, 2(10), pp. 907–913.

Hajikazemi, S.; Andersen, B. and Klakegg, O.J., (2015). Barriers against effective responses to early warning signs in projects. *International Journal of Project Management*, 33(5), pp. 1068–1083.

Herrman, H.; Stewart, D.E. Diaz-Granados, N.; Berger, E.L.; Jackson, B. and Yuen, T., (2011). 'What is resilience?' *The Canadian Journal of Psychiatry*, 56(5), pp. 258–265.

Holling C.S.; Gunderson L.H., (2002). *Resilience and Adaptive Cycles*. Washington, DC: Island Press.

JBV Utredning, (2004). Utviklingen i persontrafikken på jernbanen. En analyse av årsakene til nedgangen i trafikken i perioden 2000-2003, Jernbaneverket, Oslo, September 2004.

Jernbanedirektoratet, (2019) Ny jernbane Fauske – Tromsø (Nord-Norgebanen) Oppdatert kunnskapsgrunnlag, Dokument nr.21 007 105

Jernbaneverket, (2012). Oppsummering: Hovedkonklusjoner. Available at: <https://www.banenor.no/Prosjekter/hoyhastighetsutredningen/Nyhetsarkiv/Oppsummering-Hovedkonklusjoner> Last accessed July 10, 2021

Klakegg, O.J., Olsson, N.O.E., (2010). An empirical illustration of public project ownership. *International Journal of Project Organization and management*, 2(1), pp.16-39

Klakegg, O.J.; Williams, T.; Magnussen, O.M. and Glasspool, H., (2008). Governance frameworks for public project development and estimation. *Project Management Journal*, 39(S1), pp.S27-S42.

Kutsch, E., Hall, M., Turner, N., (2015). *Project Resilience*. Routledge, New York, NY.

Masten, A.S., Cutuli, J.J., Herbers, J.E. and Reed, M-G.J., (2009). Resilience in development. In: Lopez, S.J. and Snyder, C.R., (eds), *Oxford Handbook of Positive Psychology*. Oxford: Oxford University Press.

- Miller, R., Lessard, D., (2000). The Strategic Management of Large Engineering Projects, Shaping Institutions, The MIT Press. Cambridge, USA
- Müller, R., (2017). Organizational project governance. R. Müller, Governance and Governmentality for Projects: Enablers, Practice and Consequences, Routledge, New York, NY, 11-24
- Olsson, N.O.E., (2006). Management of flexibility in projects. International Journal of Project Management, 24(1), pp.66–74.
- Phillips, S. and Smith, S.R. eds., (2011). Governance and Regulation in the Third Sector: International Perspectives. Routledge.
- Pierre, J. and Peters, P.B.G., (2000) Governance, Politics and the State. Macmillan, London, UK.
- Pryke, S.D., (2005). Towards a social network theory of project governance. Construction Management and Economics, 23(9), pp.927-939
- Rahi, K., (2019). Project resilience: a conceptual framework. International Journal of Information Systems and Project Management, 7(1), pp.69-83.
- Renz, P. S., (2007). Project Governance: Implementing Corporate Governance and Business Ethics in Non-Profit Organisations. Physica-Verlag. Heidelberg, Germany.
- Robichau, R.W. (2011). The mosaic of governance: creating a picture with definitions, theories, and debates. The Policy Studies Journal, 39(S1), pp.113-131.
- Ruth, H. and Goessling-Reisemann, S. (eds), (2019). Handbook on Resilience of Socio-Technical Systems. Edward Elgar Publishing. Cheltenham, UK.
- Ryggvik, H., (2016). Sporskiftet. Jernbaneverket 1996-2016. Oslo: Press
- Sabbag P.Y., (2020). The human factor in project risk management and resilience. In: Leiras A., González-Calderón C., de Brito Junior I., Villa S., Yoshizaki H. (eds) Operations Management for Social Good. POMS 2018. Springer Proceedings in Business and Economics. Springer, Cham.
- Söderlund, J. and Sydow, J., (2019). Projects and institutions: towards understanding their mutual constitution and dynamics. International Journal of Project Management, 37(2), pp.259-268.

Stoker, G., (1998). Governance as theory: five propositions. International Social Science Journal, 50(155), pp.17–28.

Szentes, H. Eriksson, P.E., (2016). Paradoxical organizational tensions between control and flexibility. When managing large infrastructure projects. Journal of Construction Engineering Management, 142(4), p.05015017.

Turner, N. and Kutsch, E., (2015). “Project resilience: moving beyond traditional risk management,” PM World Journal, 4(11).

Unterhitzberger, C.; Moeller, D., (2021). Fair project governance: an organisational justice approach to project governance. International Journal of Project Management, 39(6), pp.683-696.

Figure 6.1 Resilience and flexibility in projects as response to shock. Source: Adapted from Kutsch et al. (2015).

Table 6.1 Resilience approaches in different project phases and institutional levels.

Governance perspective	Institutional level	Project life cycle		
		Before decision	Execution	Operation
Corporate governance	Organisation	<i>Resource owner:</i> Create possibilities for continued business.	<i>Resource owner:</i> Avoid allocating too much risk and resource overload.	<i>Resource owner:</i> Learning and developing new capabilities.
Governance of projects	Organisation	<i>Asset owner:</i> Questioning profitability, securing value creating decisions.	<i>Asset owner:</i> Aligning to organisational goals.	<i>Asset owner:</i> Utilising and adjusting the asset for enhanced stakeholder benefits.
Governance in projects	Project	<i>Promoter:</i> Secure financing.	<i>Project manager:</i> Deliver on goals.	<i>Operators:</i> Doing business for the long-term survival.