Finland

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Country overview

Background

Finland is a northern European country, and one of the five Nordic countries. The Nordic weather conditions imply that the climate is cool and moist, and temperatures fluctuate, with winters in the northern parts of the country being especially cold, which generally creates special requirements for infrastructure construction. Finland is a small country in terms of its population of 5.5 million people (Statistics Finland, 2019), but large in terms of its area of over 300,000 km². Thus, this country of thousands of lakes is sparsely populated, creating challenges for developing and maintaining high quality transport infrastructure. In terms of its industries and businesses, Finland has, during the 20th century, transformed from agriculture and forestry to an industrialized country, with successful high-tech and service industries. It is a member of the European Union and European Monetary Union. Its citizens are highly educated and all basic and higher education offered free of charge.

The Finnish construction sector is relatively compact and dense, consisting of industrial organizations (i.e., clients, contractors, special contractors, construction product firms) involved in building construction, infrastructure, HVAC (heating, ventilation, and air conditioning), building service engineering, construction products, and surface construction operations. Overall, there are only a few key firms with

significant resources and competences in construction. Around 70% (i.e., 565 billion euros) of the national wealth is tied to the built environment, with the sector employing a fifth of the labor force in Finland (Confederation of Finnish Construction Industries, 2021). In 2019, the value of all construction production (including renovations) in Finland was 36.1 billion euros (Confederation of Finnish Construction Industries, 2021). Construction firms primarily serve the home and neighbor markets, which include other Nordic countries, Russia, and the Baltic region.

The construction sector is highly regulated: national regulations and norms condition construction practices and set boundaries and requirements for actors operating within the field. Public procurers, which include state actors and municipalities, play an influential role in the industry as major investors in the built environment. The role of different industry associations in developing standards, norms, and practices as well as facilitating cooperation among the actors has also been significant in Finland. As in many other countries, the counterproductive logic of the construction sector, including its adversarial and short-term-oriented culture, has been considered to have a detrimental impact on the productivity and performance of the sector in Finland as well. Specifically, the poor productivity of the field in the past centuries has been a key concern of relevant actors, and calls for collaboration, long-term cooperation, and the building of trust have been continuously expressed. Particularly, procurement systems with traditional lump-sum contracts as the dominant governance structure have been claimed to facilitate price-competition instead of collaboration, long-term orientation, and a focus on innovation and effectiveness (Lahdenperä, 2012). In response to this concern, public procurers initiated development efforts to promote collaborative procurement models and relational project delivery models, including private-public partnerships (PPPs), in the 1990s. PPPs are therefore a relatively new phenomenon in the Finnish context.

In this section, we analyze the brief history and unique context of PPPs in Finland and highlight key PPP projects that have been instrumental for learning in the institutional field and for future PPP projects carried out within it.

Development history of PPPs in Finland

The international PPP trend, driven by the allowance of private funding in public infrastructure projects in the UK, initiated the development of PPP practices in the

Finnish context after the mid-1990s. At this time, Tiehallinto (now the Finnish Transport Infrastructure Agency and hereafter referred to as FTIA) began exploring different types of project delivery models, with the aim to improve the collaboration, productivity, and quality of infrastructure projects. One of the investigated modes was PPPs and, particularly, the experiences from the U.K.

Lifecycle thinking (i.e., such delivery models that include also operations after the infrastructure delivery) was first piloted in a road construction project, the Järvenpää-Lahti Highway (initiated in 1997), which is widely considered the first Finnish PPP (Finnish Transport Infrastructure Agency, 2013). After this, more structured and formalized development work was carried out by universities and public research agencies, such as VTT (Technical Research Centre of Finland), who benchmarked the British experiences to further develop the Finnish practices. The early experiences of the first PPP were promising, and there was a particular drive within the FTIA to further develop the early PPP model. It was considered important to pilot different types of delivery models in the forthcoming years and gather experiences and understanding from them to share actively within the field. The first Finnish building construction PPP was initiated in 2001 by the city of Espoo (the second largest city in Finland) (Confederation of Finnish Construction Industries, 2013).

Conceptual variation and ambiguity dominated the early Finnish PPP discourse during the 2000s, as different actors attempted to make sense of the various concepts and models. In practice, there has been much variation in terms of contract scope and thus the definition of the models and terms as well, ranging from highly extensive PPP approaches to PPP models with very narrow scopes (i.e., financing arrangements and extended warranty periods only). *Private finance initiative* (‘yksityisrahoitushanke’ in Finnish) was a term first used in the context of Finnish PPPs, and, in 2003, *lifecycle responsibility procurement* (‘elinkaarivastuuhankinta’ in Finnish) was introduced as a concept in a VTT report.

The concept *project lifecycle model* was put forth by the development program (2004-2006) on PPPs initiated by the Confederation of Finnish Construction Industries. This concept gradually received a legitimized position as equivalent to PPPs in Finland. The aim of the development program was to harmonize the PPP practices in Finland, unify the definitions of PPPs, and define clear roles for the actors as well as to establish

national guidelines and a basis for the contract structures and financing models. The National Lifecycle Model report in 2009 defined the lifecycle model in the Finnish context as follows: *"[the] lifecycle model in Finland is usually defined as a method to procure construction investment and associated services where a private service provider, based on a single contract, is responsible for at least design, construction and facility services for a defined, pre-agreed period."* Approaches to PPPs in Finland, however, usually entail a specific procurement method and the notion of a private lifecycle service provider for a public sector procurement entity. Yet, because the aim to minimize lifecycle-related costs is crucial for both the public and private sector as well as for all procurement methods, lifecycle projects have also been defined in general as *"capital intensive, long-term new build and renovation projects, in whose design, construction, use, service and maintenance all the lifecycle related risks and costs are taken into account"*.

Overall, Finnish PPPs can be divided into those that are publicly funded and those that are privately funded. In publicly funded projects, the public actor arranges the financing. This type of project is typically used in municipalities' facility and building projects. In turn, private projects have been the typical form of the state's infrastructure projects, with contractors acquiring the funding. In these contexts, the term *lifecycle financing model* has also been used. The financing differences between road and railway infrastructure projects (state-related) and building construction projects (typically municipality projects) are due to procurement and taxation legislation. The public procurement legislation restricted PPP in building construction projects until its renewal in 2017. Before the renewal, private financing was only possible in the state's large infrastructure highway and railway projects. . This renewal has been expected to increase the use of PPPs in the future, as it is now expected that projects of over 50 million euro will receive private financing in the building sector.

In general, in Finland, the PPP model typically refers to a privately funded lifecycle model. To some extent, even Finnish Design and Build (DB) project delivery models could be considered PPP models in U.S. contexts, since, in Finland, the DB form highlights the partnership between private and public actors. The spread and development of PPPs has been acknowledged as a highly political phenomenon in many countries, while the pros and cons of private funding schemes have been debated. In the Finnish context, this kind of discourse has been relatively modest.

Significant early PPP projects in Finland

The first extensive and comprehensive PPP in which private actors took responsibilities for planning, design, financing, construction, and maintenance was the **Järvenpää-Lahti Highway**, whose contract was signed in 1997. The value of the contract was approximately 210 million euros for a 15-year contract term. The owner of the project was the FTIA, and the service provider was the highway company established for the specific project (“Tieyhtiö Nelostie”). The responsibility for the outcome of the project was handed over to the FTIA in 2012.

The Kaivomestari project, initiated by the City of Espoo, was initiated in 2001, and it was the first PPP building construction project in Finland. The service provider was Arandur Oy, and the project was financed by SEB Leasing Oy. The value of the contract was 120 million euros for a contract term of 25 years. The contract involved design, financing, construction, service, and maintenance as well as user services. To date, this is the only facility project in Finland in which a specialized project company was established. The city of Espoo has been a highly active actor in the PPP market, helping to promote and develop the PPP model forward. We will introduce this project in more detail as the first example project later in this chapter.

The Muurla-Lohja E18 Highway, initiated in 2005, has been the largest PPP project in Finland to date, with a contract value of 700 million euros for a contract term of 25 years. The main actors of the project are the FTIA and the service provider company Tieyhtiö Ykköstie, which further consists of financiers and infrastructure companies. The contract involved design, financing, construction, service and maintenance, and a tendering phase applied dialogue-based negotiation strategy, which was relatively novel in Finland at that time. This meant that the client engaged in a dialogue and more specific negotiations with the bidders and requested the best and final offer based on the negotiations. The service provider was then selected based on this offer (Finnish Road Administration, 2014). The Muurla-Lohja highway was part of the FTIA’s piloting approach toward novel delivery models, and, interestingly, as this pilot was launched, experimentation with an alternative approach, i.e., a project alliancing model, was postponed at that time. We will introduce this project in more detail as the second example project in this chapter.

Both example projects represent PPP projects with a lifecycle contract and an operations phase still ongoing. Therefore, we cannot determine whether either of these projects is a “success” or “failure”, since their success cannot be assessed merely on the basis of the completed construction phase. Instead, both projects can be considered significant due to their groundbreaking role in the Finnish PPP community. Moreover, both projects have their unique features and consortia, and each of them offers a unique viewpoint on the possibilities of PPP projects in a specific industry, namely property construction and transport infrastructure. We selected them as example projects due to their pioneering role in the development of PPP models in Finland.

Institutional framework

Scott (2001) presented a typology of the institutional elements nested in different institutional carriers across multiple levels of the institutional field and referred to as the three pillars of institutions: *regulative* (including laws and sanctions), *normative* (including norms, standards, and certificates), and *cultural-cognitive* (including cognitive scripts, schemas, and taken-for-granted beliefs). We have organized the analysis of the Finnish institutional framework in line with this structure below. Institutional perspective has proven to be a promising lens in illustrating and explaining the changes taking place across various levels of institutions in the context of industries (Söderlund and Sydow, 2019).

Regulatory framework

The Finnish procurement legislation, which is based on EU directives, regulates the procurement practices of Finnish PPPs. The new public procurement legislation was enforced in January 2017 in Finland, and it strongly enforces a focus of public procurement units on lifecycle costs. In addition, competitive dialogue was introduced as a routine procedure, with the aim of establishing the required flexibility to defining and managing the project scope, particularly into more complex public procurements. Lifecycle contracts as a complex and long-term contractual arrangement require particular emphasis on the co-operation and collaboration of the actors involved. Therefore, the legislation aims to guide the actors to understand each other’s objectives and aims, to align the objectives, as well as to establish trust, openness, and loyalty. In essence, in the renewed legislation, the establishment of trust and its

maintenance is considered one of the guiding principles when developing contractual arrangements between actors.

One distinctive feature of the Finnish PPP market is that different kinds of procurement and taxation rules have been applied to state-owned public infrastructure and highway projects in comparison to building construction PPP projects primarily owned by the municipalities. This has led to a division of the market and its practices. In practice, the different taxation regulations and laws allowed the use of PPP models, which included private funding only in transport infrastructure (road and railway) projects, until 2018.

Normative framework

PPP-related policies, norms, guidelines, and procedures have been developed in Finland through collaboration among multiple construction and infrastructure industry stakeholders, including construction sector associations, agencies, municipalities, and important service providers. Significant milestones include lifecycle project-oriented research and practice development schemes and programs, in which the establishment of guidelines, standards, and procedures has been the primary goal. With regard to the development of norms and practices, the Confederation of Finnish Construction Industries, the Association of Finnish Municipalities, and Rakli (an association of professional property owners, real estate investors, corporate real estate managers, and construction clients in Finland) have been major actors with the leading procurer, FTIA, other major cities, and research agencies, such as VTT. Furthermore, The Ministry of the Environment has been strongly promoting PPPs as part of the Healthy Premises Program, while the Ministry of Treasury and Finance has been investigating the value creation potential of PPPs in different contexts. Furthermore, the City of Espoo has been especially actively promoting and developing PPP models in its own project development context. In practice, such development has been mainly led by the clients' consultants in the procurement strategy development phase.

The building construction sector has developed its own practices, standards, and contractual forms for building construction PPPs, and the contract model basis was launched in September 2013. The model does not include a financing component. The model has been developed based on practical experiences with PPP projects. The

impact of the financing component of the model has also been under investigation after the taxation renewal in 2018, which enabled the use of private financing for building construction PPPs.

Furthermore, a multi-disciplinary industry working group has been developing a contract standard and common contract clauses for Finnish privately and publicly financed PPPs. As an outcome of this work an instruction card RT103144 has been published in September 2020. The card give basic information on the PPP model and describes the central concepts of the model. This development work has been coordinated by the Confederation of Finnish Construction Industries.

Cultural-cognitive framework

Overall, in Finland, both the state and municipalities, i.e., public clients, have been strongly promoting PPPs, but, in practice, the willingness of construction companies to tender has not been high thus far. This is partly because PPPs often require significant competences and resources as well as financing experience from the involved construction companies. Overall, PPPs have been considered relatively risky by private companies in comparison to other types of delivery models, and an attitude with a certain degree of skepticism has been dominating the mindset of many service providers. In addition, the negotiation periods and processes of large PPPs have been experienced as complex and long in their duration, entailing multiple negotiation phases with a focus on dialogue between the procurement unit and tendering firms. This has led to a questioning of the benefits of the model in addition to uncertainties considered to be related to the long-term contract period. An example of the market situation and such prevailing uncertainty is the major Puolarmetsä hospital project in Espoo in 2011, which was planned to be implemented with PPP; however, there were no bidders (Rakennuslehti, 2011).

The use of PPPs requires changes in the orientation of its actors toward long-term co-operation instead of localized short-term optimization, which has been more or less the dominating approach in the Finnish construction industry, where conflicts among clients and service providers have been frequent. A shift in the mode of thinking with regard to collaboration and co-operation can, however, be considered to be underway. This development has been driven by the introduction of collaborative project delivery models, namely project alliances, which were introduced in 2011 and whose use has

spread rapidly within the industry. The major driver for the collaborative behavior among the stakeholders was the major clients', particularly FTIA's will to advance collaborative project delivery approach in the industry. FTIA considered collaborative and integrated project delivery models as a solution to the sector's productivity problems and management of complex projects (Matinheikki et al., 2019). So far, over 70 integrated and collaborative projects have been implemented, and many actors within the field are of the opinion that the introduction of project alliancing and its related collaborative ways of working has significantly paved the way for other types of collaborative modes of project delivery and developed the collaborative capabilities of the actors. This shift in thinking, particularly promoted by the public clients, can also be expected to influence the attitude of actors toward the long-term co-operation required for PPPs. The use of integrated models of delivery and multi-actor contracts have also promoted tighter collaboration and use of integrative practices among the key actors, which, in turn, has decreased the disintegration of construction supply chains seen during the 2000s.

Service provider doubts have been particularly related to the potential for co-operation in the face of uncertainty, as the contract periods are extensive (maximum 30 years). On the other hand, increasing concerns with interior air quality and mold problems, which have been causing problems in relatively new buildings as well, have attracted actors to consider long-term PPP arrangements as a potential solution. There has also been keen public interest to facilitate the use of PPP models in renovation projects, but they have often been considered too risky by companies. In general, clients have expressed mostly positive attitudes towards PPPs in Finland as the usability of the products has improved and the applied technical solutions are long-term oriented.

The core changes of the institutional framework over time are summarized in Table 1.

Table 1. Institutional framework in the Finnish PPP scene over the past decades.

	Mid 1990s-2000	**2000-2010**	**2010-present**
Regulative element	• Examination of collaborative project delivery models and exploration of how these models are enabled by the legislation	• Legislation restricted the use of PPPs, particularly in building construction projects	• The public procurement was renewed in 2017, which enabled private financing also in building construction projects. • The renewed legislation was expected to increase the number of PPPs
Normative element	• FTIA explored different types of project delivery forms with the aim of improving collaboration in projects • Benchmarking of experiences from the UK • Good experiences from first pilot project encouraged developing the model further	• Piloting of different types of collaborative project delivery models was initiated at FTIA • A development program to harmonize PPP practices in Finland, unify the definitions for PPPs, and establish national guidelines for contract structures and financing models was initiated by Confederation of Finnish Construction Industries	• The Ministry of the Environment strongly promoted PPPs as part of the Healthy Premises Program, and the Ministry of Treasury and Finance investigated the value creation potential of PPPs in different contexts • The building construction developed its own practices, standards, and contractual models for the building construction PPPs, and the standardized contract model was launched in September 2013. • A multi-disciplinary industry working group developed the standard contract and common contract clauses for the Finnish privately and publicly financed PPPs issued in 2020. • New models are being developed, including a model combining project alliancing and lifecycle models
Cultural-cognitive element	• FTIA argued for the benefits of PPPs and spread the message within the industry • Questioning of the current project delivery arrangements	• The state and municipalities, i.e., public clients, were strongly promoting PPPs, but, in practice, the willingness of construction companies to participate in the projects was low because of the long-term contract period.	• The negotiation periods and processes of large PPPs were considered as complex and long, entailing multiple negotiation phases, which led to the questioning of the benefits of the model. A shift in the mode of thinking with regard to collaboration and co-operation has been underway due to the introduction and use of collaborative project delivery models, namely project alliances.

PPP market

Since 1997, altogether 70 projects that can be considered PPPs have been conducted in Finland. All these projects have adopted a lifecycle model, but the funding source has varied between public and private depending on the type of the project. So far, 45 out of these 70 projects have been PPPs procured by cities and municipalities (mainly building construction PPPs), while 25 have been state-owned infrastructure projects. The overall value of the building construction investments has been approximately 1.3 billion euros, and 40 out of these 45 projects have been school projects, with the remaining five being daycare facilities and healthcare sector projects (Tompuri, 2018). Nineteen projects (out of 45), with a 560 million euro value in total, have been implemented in the City of Espoo. A major share of these projects have been carried out after 2009, and none of these projects have yet reached the end of their contract period. Consequently, particularly school and daycare project models, in which municipalities are typically involved, were further developed during the 2010s.

The main procurement units in the Finnish PPP scheme include state-owned agencies, the primary of which is the FTIA, which is responsible for public road and railway projects, and municipalities, which typically procure building construction PPPs. Particularly, the City of Espoo has been an active pioneer in introducing new PPP models. Their new procurement model, which can be characterized as a PPP program, enables the combination of projects and is expected to attract more bidders. Private constructors may also implement PPPs, but this mode of operating has been rare.

Designers, contractors, and other lifecycle service-oriented companies are involved in PPPs. All the major private companies in the Finnish infrastructure and construction sector have gained experience from PPPs. Two major firms (recently merged), Lemminkäinen and YIT, have been particularly active in the field. Lemminkäinen has been involved in around 20 projects and YIT in 10. The fact that YIT has had its own HVAC company has equipped it with better capabilities to estimate lifecycle costs related to maintenance. After the merger of YIT and Lemminkäinen as the new YIT, the firm is now a major actor within the PPP market. In addition, such construction companies as NCC, Lujatalo, SRV, and Skanska have been involved in PPPs. However, Skanska has been generally considered to view them as risky, which is potentially related to their lack of in-house HVAC competence.

To date, PPPs have not been used in rail construction projects. Overall, the share of PPP projects of all project deliveries in the public road construction sector is around 2%. However, the value of PPP projects in euros is around 23% of the total value of road construction projects (data from 2019, source Väylä). Figure 1 introduces the share of PPP, alliance, DB and traditional procurement projects, both in euros and number of projects.

Figure 1. The share and monetary value shares of different Finnish road construction project delivery models in 2019.

Future prospects

In the future, a steady increase in PPPs in Finland is expected, which is primarily due to the renewal of PPP-related legislation in 2018. The use of project alliances in the Finnish infrastructure and construction sector increased significantly during the 2010s after the new project delivery form was introduced to the market. The use of alliancing has potentially negatively affected the share of PPPs as a project delivery form within the infrastructure sector, as alliances and PPPs are often considered substitute options for the procurement strategy formation phase. As public procurers have wanted to experiment with project alliancing when procuring complex products, they have, in some cases, abandoned the initial idea of using PPPs. However, in general,

the use of PPPs is estimated to increase in the forthcoming years, particularly as following the recent economic downturns, several Finnish municipalities are struggling financially. The PPP model was also recommended in a recent influential report (Virtanen, 2017) to overcome air quality and mold problems in building projects, as they are expected to ensure value creation over the project lifecycle and ensure a focus on solutions that are optimal from the perspective of the users. Novel hybrid forms combining project alliance and lifecycle-oriented thinking are also expected to emerge in the future. It is also expected that the example set by the City of Espoo will promote the use of PPP programs in the future if the experiences with this model are positive.

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SchoolProject: The first property construction PPP project in Finland

The first example project was chosen due to its groundbreaking history: it was the first property construction PPP project in Finland, and its learnings paved the way for PPP use and refined the requirements for such projects elsewhere. The scope of the project included the construction and operation of a new high school, a sports hall serving both the school during the day and public users in the evening, a swimming hall, and connected outdoor areas. The facility offers physical therapy services as well.

The project took place in Espoo, the second-largest city in Finland. The new high school was the first school in Finland, possibly even in all the Nordic countries (Helsingin Sanomat, 5.8.2003), in which a municipality was only responsible for the teaching work within the school premises while private companies took on all other responsibilities regarding the premises. We use the pseudonym “SchoolProject” because most of the attention, for example in the newspapers, was focused on the school part of the project (instead of the other parts of the project - the sports hall, swimming hall, and outdoor areas).

The project received considerable public attention throughout its lifecycle due to its groundbreaking nature, and it was well-documented and publicly communicated, e.g., through newspaper articles, theses, and publicly available reports and presentations. Table 2 summarizes the key features of the project.

Table 2. Background information of SchoolProject.

Scope	● The construction and operation of a new high school (~550 students), a sports hall (max ~800 customers), a swimming hall (max ~250 customer), and related parking and outdoor areas. ● Delivery model: design-build-finance-operate (DBFO).
Location	● Espoo, Finland.
Budget	● ~140 MEUR
Schedule	● Construction phase: 2001-2003. ● Operations phase: 25 years (until 2028).
Client and users	● Client: the city of Espoo, technical services.

	● Users: the city of Espoo, educational, sports, and social and health services.
The PPP consortium	● Project financier and owner of the property: SEB Leasing Ltd. ● Project company: Arandur Ltd. ○ Construction company: NCC. ○ Service providers: NCC (construction engineering), Caverion[1] (technical building services), and Sodexo (facility services). ○ Key subcontractors: Elisa and Fujitsu (IT services for the high school).

Project background

The key theme pressuring the implementation of SchoolProject was the rapid growth of Espoo. Espoo was, and still is, together with the other cities of the capital region, the fastest growing area in Finland. Consequently, there was an increasing need for the construction of new public infrastructure, including schools. As the situation was described in a newspaper article in 2000:

> *"The construction plan of Espoo for next year and the following years is record-breaking but even that does not seem to be enough. For example, there is a need for more schools than is included in the construction plan."* (Helsingin Sanomat, 30.12.2000)

The growth of the city was evident in the budget proposal by the city mayor in 2001 as well:

> *"The construction program includes ten new schools and a similar number of renovations. Numerous health centers, kindergartens, streets and other municipal infrastructure will be built as well."* (Helsingin Sanomat, 9.1.2001)

In addition, the city district where SchoolProject was situated had suffered from somewhat of a bad reputation. New public facilities, such as a library or a high school

[1] At the time of the project's implementation and early operations phase, the company name was YIT. The technical building services of YIT were demerged to Caverion in 2013.

(i.e., SchoolProject), were considered beneficial for the attractiveness of this city district.

Regarding the project delivery model, a few different reasons for adopting the PPP model can be identified. First, collaboration between the public and private sectors had already gained legitimacy in Espoo from earlier strategic decisions. In the late 1990s, Espoo had started a development initiative to promote alternative ways for delivering public services. The main goal of the development initiative was to achieve cost savings by increasing the role of private companies and non-profit organizations in delivering public services. After a few years, the city had already increased the role of private companies in elderly care, home care, cleaning, and public transport, for example. Similar goals were expressed in the city's strategy during 2000-2002 as well.

Second, although SchoolProject was among the first PPP projects in Finland, some experience had been gathered in an earlier motorway project (i.e., the Järvenpää-Lahti motorway). In December 1999, a study on the applicability of the PPP model for public property construction projects in Finland was published (Tekes, 1999). The study concluded that there were no legal or other barrier for using a PPP model in such context. The PPP model was considered an addition to, instead of a replacement of, other procurement models, however. Importantly, this 1999 study proposed SchoolProject as a potential case project for piloting the PPP model in public property construction projects. Consequently, there was clear interest in piloting PPP projects in Finland and Espoo. In addition, there was some information available from similar projects in the U.K, for example.

In summary, the rapid growth of the city created demand for various investments, including new schools. The significance of these investment plans created pressure on seeking additional forms of project funding. Previous experiences in public-private collaboration and PPP projects in Finland and abroad, combined with the strategic goals of Espoo, made the PPP model a more familiar and acceptable alternative for SchoolProject.

The timeline of the project is illustrated in Figure 2. The different phases of the project are discussed in the following section.

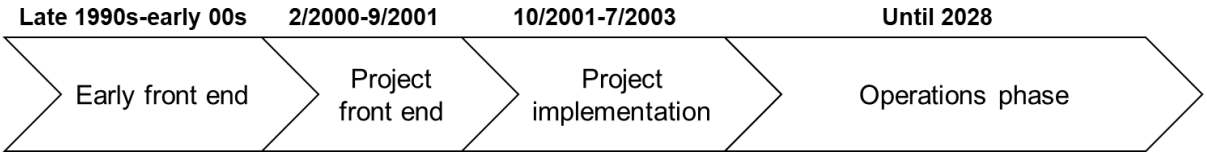

Figure 2. The timeline of SchoolProject.

Project planning

The preparations for the project began in winter 2000. In February 2000, the city council decided to start a competitive bidding process for the project. The council emphasized that the process should include a financial comparison between the PPP and a public construction alternative as well.

Already during this stage, it became evident that opinions on private financing were quite divided among the decision-makers (i.e., the councilors). In particular, there were different perceptions regarding whether the PPP alternative could be financially sounder than a traditional public alternative. As some critical voices argued: *"why would private financing be more affordable, when the private financier expects return on the investment?"* (a councilor opposing the PPP alternative). Another opposing councilor went even further and called it *"a complete illusion, that a privately funded project would be cheaper."* Earlier, the chairman of a party group with a critical attitude towards SchoolProject commented on experiences with the previous Järvenpää-Lahti motorway project: *"the motorway was constructed very well, but the project was expensive"*. Around the same time, Professor Jouko Kankainen (Construction Economics, Helsinki University of Technology), took a more neutral stance on the debate:

> *"According to the professor, PPP model is worth trying in SchoolProject. However, he reminds that private financing is not always more affordable than public funding. It all depends on the results of the contract negotiations."* (Helsingin Sanomat, 1.9.2001)

Despite the partly divided opinions among the councilors, the city council decided to initiate the competitive bidding process and set the following requirements:

- Following the strategy of Espoo, the project will be implemented as a product development project.

- The scope of the project will include both the new high school and the related sports facilities.
- The project will be prepared as a long-term service contract.
- The running and teaching of the high school will be organized by the city.

The rationale behind the first requirement, SchoolProject being implemented as a product development project, was that the project could be used as a platform for learning as well as developing the processes of Espoo. The city of Espoo has implemented numerous PPP projects (especially schools and kindergartens) since, so there have been new avenues for this kind of learning.

The city hired a group of consultancy and legal companies to assist in the competitive bidding process. The task of this group was to assist the city in preparing the calls for offers and comparing the bids. Based on a competitive bidding process, the company KPMG was selected to lead this group.

Project procurement

The competitive bidding process took place in two phases. The first phase was an initial call for interest. This call for interest was published in the official newspaper of the European Union, and it attracted expressions of interest from five consortia. Of those five expressions of interest, two were considered insufficient because they indicated an interest in only a certain part of the project. Consequently, a call for offers was sent to the three remaining consortia, which were all led by large construction companies operating in Finland: YIT, Skanska and NCC. In the call for offers, the requirements for both the facilities to be constructed and the service elements in the operations phase were defined in quite a lot of detail.

The call for offers included the following criteria for comparison:

- Financial implications
- Quality and technical aspects in the planning and construction phases
- Quality in the operations phase
- Reliability
- Contractual aspects

All three consortia answered the call for offers. Due to the extensive and complex nature of the material, and partly due to a lack of earlier experiences in Espoo, the process continued in the form of negotiations. The process was prolonged by about half a year. According to the head of technical services in Espoo, the delay in the process was due to *"difficulties in comparing the complex offers and contracts."* (Helsingin Sanomat, 31.5.2001). Based on the first negotiations, the offers of YIT and NCC were considered stronger in terms of their financial implications. Thus, negotiations continued with these two consortia.

The final decision to commit to the project was made by the city council in September 2001. The city council chose NCC Finland as the main contractor for the project. The offer of YIT was more affordable in terms of financial implications only, but the offer of NCC was considered more affordable as a whole. The main difference between the two best offers was in the "contractual terms" and "quality in the planning phase" criteria.

At the very beginning of the project preparations, in February 2000, the city council had also requested a comparison between the PPP and the public construction alternative. To conduct this comparison, the technical services of Espoo wrote a comparable project plan following a public construction logic based on the requirements defined by the educational services (i.e., teaching and the high school), social services (i.e., the physical therapy), and the sports services (i.e., the sports facilities and swimming hall). The comparison was based on this project plan for the construction project as well as on historical data regarding the operations phase. The comparison between the public alternative and the PPP offer of the NCC consortium assessed the PPP alternative as more profitable than the public construction alternative (the discounted costs over the project lifecycle were assessed as 264 versus 311 million Finnish marks, which is about 44 versus 52 million euros in 2020 figures).

Project implementation

The implementation of SchoolProject progressed without any major issues or disruptions. In fact, there were very few comments in the media during project implementation. The only exceptions were a couple of appeals against the project, which addressed the size and location of the new buildings.

The buildings of SchoolProject had been granted a building license in February 2002. However, a neighboring housing corporation filed an appeal against the project. The core argument of the appeal was that the location and dimensions of SchoolProject deviated slightly from the town plan. In particular, SchoolProject was being built, according to the complainers, too close to a river. Finnish law allows authorities to make exceptions, however, if they are minor in proportion to the size of the project. The complainers and authorities disagreed on whether these exceptions should be considered minor. A little later, appeals were filed on a few other bases as well. One example was the facade of the new building endangering the scenery of the riverside. None of these appeals led to any action, however, and the project progressed according to schedule.

The project was completed very close to the original schedule. The swimming hall was opened to the public on the 4th and the sports hall and the swimming hall on the 12th of August 2003.

Operations phase

The project moved to the operations phase in autumn 2003. As already defined in the service contract at the project front end, the PPP consortium (i.e., the project company) was responsible for all operations of the new facilities except school management and teaching at the high school.

Regarding contracts, there were three contracts in place between Espoo and the project company (see also Hänninen, 2009):

1. A service contract between Espoo and the project company.
2. An agreement between Espoo, the project financier, and the PPP consortium on the right to purchase the facilities.
3. A rental agreement between the project company and the project financer.
4. A land lease agreement between Espoo and the project financier.

The key responsibilities are illustrated in Figure 3.

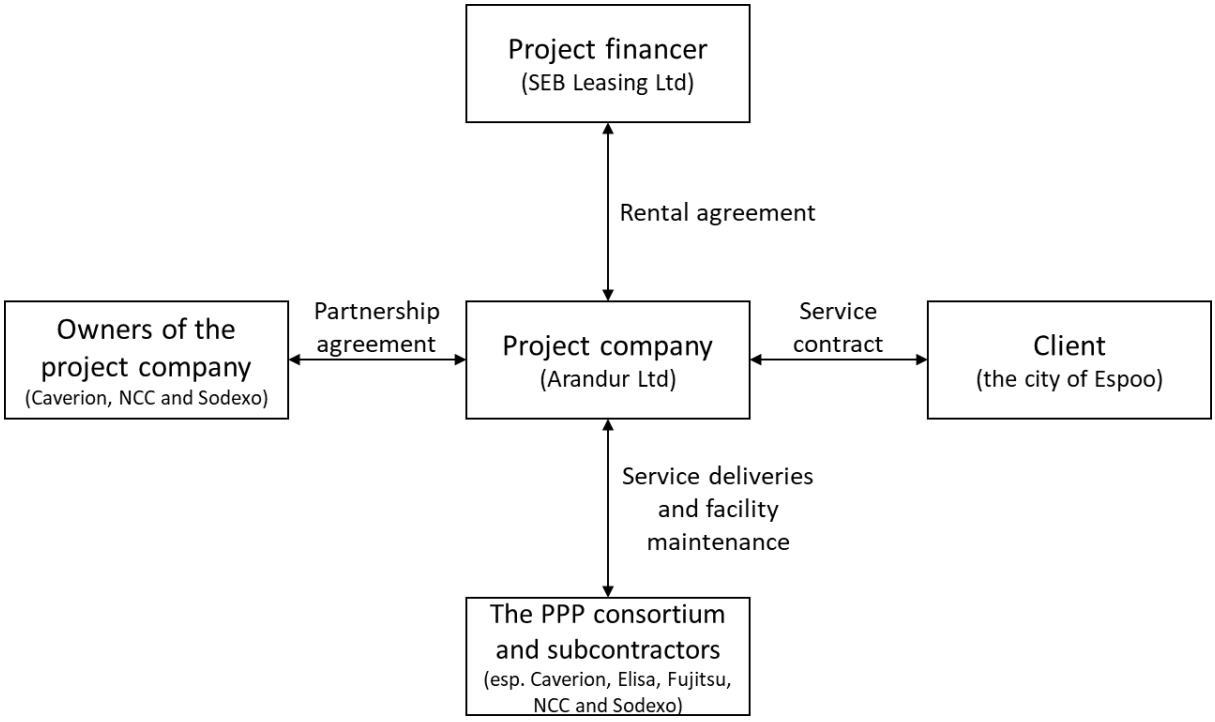

Figure 3. The main responsibilities of the different actors in the operations phase of SchoolProject.

The monthly service fee paid by Espoo to the project company consisted of both fixed and variable components. The fixed component covered the costs of the construction phase, and the variable component related to the service operations performed by the consortium or its subcontractors. If there are issues in the service operations, service level, or availability of the facilities, sanctions can affect the variable component of the service fee. An example of such sanctions was a situation in which there was a problem with the roof of the high school (Hänninen, 2009). Due to this problem, parts of the facilities were out of use for two months. Consequently, the service fee was reduced to match the decreased availability.

Public value in SchoolProject

The previous sections have described the key events throughout the lifecycle of SchoolProject. In this section, we conclude our findings from this example project. We do this especially by discussing the achievement of public value in this project.

The achievement of public value in SchoolProject is categorized into three dimensions of value creation, financial value, service value, and systemic value, as summarized in Table 3.

Table 3. Public value in SchoolProject.

Element of public value	**Findings and learnings from the example project**
Financial value: was the taxpayers' money used efficiently in SchoolProject?	• Financial analyses illustrate the project being possibly quite expensive, in comparison to a traditional public alternative. • The complexity of the PPP contract caused some issues throughout the project lifecycle and created uncertainty in assessing the financial profitability of the project.
Service value: does the PPP delivery model secure or promote the provision of quality services and high service level in SchoolProject?	• Especially according to the project representatives and those supporting the PPP model, the payment model of the PPP contract has secured the provision of high-quality public services (e.g., maintenance) throughout the operations phase. • According to the same sources, without the PPP model the quality of services and service levels could be endangered in difficult financial situations (i.e., due to cost savings).
Systemic value: how did the PPP delivery model enable and promote the initiation of SchoolProject and related consequent public projects?	• Especially according to those supporting SchoolProject in the project front end, the different funding logic of the PPP model enabled, or at least promoted, the initiation of the project. • Later, the city of Espoo has implemented numerous school projects and similar projects (e.g., kindergartens) with the PPP model. These can be seen as descendants of SchoolProject.

Concerning **financial value**, as the service contract period of 25 years is still ongoing, it is not possible to analyze the project costs over the whole project lifecycle, yet. However, the financial feasibility of the project for the city of Espoo has been questioned to some extent. For example, a comparison between the PPP model and a comparable public construction alternative was conducted in a master's thesis (Räikkönen, 2007). The conclusion was that the discounted lifecycle costs of the PPP model are 2.4 MEUR higher than the public construction alternative. As discussed earlier in this chapter, a comparison with contrasting conclusions was made by the city at the project front end. Especially regarding the private financing component of the PPP model, the mayor of Espoo did indeed admit in 2007 that "*the financing component was not really that sensible or affordable" (Helsingin Sanomat 6.11.2007).*

The assessment of financial profitability of SchoolProject was made more challenging by complexities and uncertainties in the PPP contract. Challenges in comparing the offers of PPP consortia caused a delay in the project front end. Later, a disparity between the estimates in the PPP contract and the actual usage of the swimming hall created significant and surprising extra costs for the city. In the implementation phase, there were no significant delays or any similar issues, though.

The findings from SchoolProject do not indicate the PPP contract form as an automatic guarantee of financial profitability for the public sector. Even oppositely, this example project illustrates potential pitfalls such as the terms of the private financing component and the complexity of contract terms.

SchoolProject benefited from the PPP model particularly in terms of **service value** (i.e., the delivery of quality services and high service levels). This viewpoint was brought up especially by those supporting the project when its direct financial implications were challenged or criticized. The PPP model in a project such as SchoolProject secures or guarantees high quality service provision over the whole operations phase. In the case of SchoolProject, this relates to services such as maintenance. This viewpoint has been described by two representatives of the city:

> *"The new high school is now 10 years old and qualitywise it is still like new"* (Facilities Service Manager in Espoo, Helsingin Sanomat 23.10.2015)

> *"Through the PPP model, we get a guarantee that the buildings are in good quality every day. If it were not to happen, the project company would pay us sanctions."* (Head of Technical Services, Helsingin Sanomat, 6.11.2007)

The relevance of this viewpoint for the discussion about public values stems from the comparison between the PPP model and earlier experiences of the city. As earlier experiences in Espoo were described in the decisive city council meeting in September 2001:

> *"Traditionally, the actual costs of service and maintenance have been more related to the availability of funding than to the need for appropriate maintenance."* (Espoo city council, September 2001)

Caverion, one member of the PPP consortium, describes the same issue in its reference page for the project:

> *"The city of Espoo has many properties that require constant maintenance. Due to constant savings, it has been difficult for the city to maintain the properties. -- [due to the PPP contract] Espoo has fixed yearly costs and there is no need to allocate maintenance funds from the budget."* (Caverion web page)

The importance of considering the whole lifecycle was linked to the viewpoint of financial feasibility. Quotations such as the following challenge the criticism of the project being financially unprofitable for the city:

> *"If we were to build a high school by ourselves and then maintain it for 25 years [i.e., the duration of the contract], the overall costs would reach 100MEUR [i.e., the value of the contract]."* (the Director of Finances in Espoo, Helsingin Sanomat 5.3.2011)

While there are no further analyses available to assess the balance between financial and service value, but the above examples illustrate that the payment mechanism of a PPP project can secure or guarantee the provision of quality services and high service levels (e.g., maintenance) throughout the project's operations phase.

Besides project-specific public value, SchoolProject has delivered **systemic value**. Systemic value refers to the potential of the PPP model in enabling the investment in the first place and promoting the initiation of other development activities and investments. In a PPP model, the city funds the new school through long-term monthly service fees paid to the PPP consortium instead of increasing its amount of debt. As a few councilors of the conservative party described: *"Without private financing, the building of the new high school, the sports hall and the swimming hall would have been delayed by years."* A similar argument was stated in the draft decision of the decisive city council meeting in September 2001.

The example above can be considered an indication of the PPP model enabling the initiation of such projects that could not be initiated as traditional public procurements. This way, it can be argued that through PPP projects a city can create value for its citizens, not necessarily achievable otherwise.

Later, similar viewpoints regarding funding and ownership in general were expressed by the head of technical services in Espoo: *"when a city is facing financial difficulties, why should it* own *schools, kindergartens or hospitals?"* (Helsingin Sanomat, 15.3.2003). In the same newspaper article, a manager of a public funding agency also continued: *"In the future, the work will be divided even more between the city, the finance and the constructor. Why should a city gather itself property?"*

Led by SchoolProject, the city of Espoo has implemented numerous PPP projects since. In late 2018, the total in Espoo was nine completed projects, two projects under construction, and two projects under preparations. Most of these projects have been schools and kindergartens.

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Räikkönen, V. (2007). Elinkaarimallin kokonaistaloudellisuus julkisten tilapalveluiden järjestämisessä (Macroeconomicality of the Public-Privet Partnerships in public facility services). Master's thesis. *Lappeenranta University of Technology*.

Tekes (1999) Unpublished project report. *Tekes.*

Newspaper articles

66 newspaper articles between 2000 and 2018, mostly from Helsingin Sanomat (the main newspaper of the capital region of Finland).

MotorwayProject: The largest road construction project in the history of Finland

Like SchoolProject, the second example project was chosen due to its distinctive characteristics: It was the second motorway PPP project and, at the time of construction, due to its scope, the most expensive road construction project ever in Finland. The project was an extension of the motorway between Turku (the largest city in southwest Finland) and the capital region of Finland. The scope of the project included the construction and operations of a 51.3 km long motorway including seven road tunnels. At the time of its completion, one of the road tunnels, Karnaisten tunnel, was the longest in Finland (2.3 km). This project finalized the nonstop motorway link between the city of Turku and the Helsinki capital region.

Due to the road's influential role concerning commuting between Turku and the capital area and the project's pioneering lifecycle contract model, the project was actively documented, discussed, and debated in newspapers, theses, and publicly available reports and presentations. Table 4 summarizes the key features of the project.

Table 4. Background information on MotorwayProject.

Scope	● The construction and operations of a 51.3km long motorway, including seven road tunnels. ● Service period: 21 years (until 2029). Service payments are based on the availability and service level of the motorway. ● Delivery model: design-build-finance-operate (DBFO).
Location	● A motorway connection between Muurla and Lohjanharju. The project finalized the motorway connection between Turku and the capital region. ● The motorway is also part of the European route E18 (from Craigavon, Northern Ireland to Saint Petersburg, Russia).
Budget	● ~700 MEUR in total, of which ~335 MEUR was used in the construction phase.
Schedule	● Construction phase: 2005-2009. ● Operations phase: 21 years.
The PPP consortium	● Client: the FTIA. ● The PPP consortium Tieyhtiö Ykköstie Oy ("Road Company Motorway One Ltd"): an investment fund company (John Laing Infrastructure Fund) and a construction company (Skanska).

	● Key partners: two construction companies responsible for road maintenance services (Skanska and Lemminkäinen) and three service providers responsible for project planning (Ramboll, Sito and Pöyry).

Project background

The motorway between Turku and the capital region has a long history. The first motorway section was completed in the early 1960s, and it was also the first motorway built in Finland. This section was later extended in the late 1960s and early 1970s. Since that, the 165 km long road has been modernized into a motorway step-by-step so that the motorway sections between Muurla and Paimio and Lohja and Lohjanharju were finalized in 2003 and 2005. After the second-to-last section between Lohja and Lohjanharju was completed, the only section without a motorway was the 51.3km route between Muurla and Lohjanharju. The scope of MotorwayProject was to construct and operate this last motorway section, finalizing the motorway link between Helsinki and Turku.

The need for the road improvement and MotorwayProject stemmed from the inadequacy of the old road. The road between Turku and the capital region is one of the most travelled routes in Finland. It is also an important freight route, with heavy traffic from Turku harbor to the capital region as well as to eastern Finland and to Russia. The traffic flows in this route had increased significantly and even more rapidly than in most of the other main roads in Finland. Consequently, the quality and capacity of the old road were considered insufficient for the growing amount of traffic.

Due to the high importance and significant scope of the project, MotorwayProject was planned, prepared, and analyzed in numerous studies in the early project front end. Several studies discussed the need for this project by analyzing the expected benefits and comparing different project alternatives. In these different studies and reports, the three most discussed viewpoints included road safety, travel times and the flow of traffic, and environmental concerns.

The following discussion is based mostly on the report on the socio-economic implications of MotorwayProject published by the FTIA in 2001 (FTIA, 2001). This report summarized most of the earlier reports and analyses conducted since the late

1980s. Throughout the report, a comparison between three general alternatives is conducted: the “no changes” option (i.e., the old road), the motorway option (i.e., MotorwayProject) and the option of smaller improvements (e.g., additional lanes to existing roads). Due to the increased traffic volume, the old road was increasingly prone to congestion. As was written in the 2001 report: *“the road has significant morning and afternoon rush hours”* and *“the road between Muurla and Lohjanharju has only two lanes, which makes overtaking difficult”*. The latter quotation exemplifies how most of the other sections of the route had been improved, making the MotorwayProject section of the road a bottleneck. The 2001 report summarized the situation as follows: *“if the project is not implemented [at least as smaller improvements], the forecasted increases in traffic volumes cannot be managed.”*

The problems of congestion were worsened by the relatively high share of heavy traffic on this road in comparison to many other main roads in the country. All in all, accidents, heavy traffic, and traffic jams were frequent causes of slow travel in the road.

In terms of road safety, there had been an overall improvement in Finland for years. In contrast to this positive trend, the number of accidents had not decreased in the area of the proposed MotorwayProject. In 2001, the accident frequency in this road was estimated to be 10-35% higher in this section than in comparable roads elsewhere in Finland. The higher number of accidents was, in addition to the increased traffic volumes, especially due to the high number of curves and hills limiting visibility in many sections of the old road. The report concluded that the motorway option would be a significant improvement in terms of road safety. According to the FTIA, the new motorway could *“save 50 lives and prevent 250 accidents leading to injuries over 10 years.”*

The increased traffic volumes and the viewpoint of road safety were the most emphasized viewpoints promoting the construction of a new motorway. The core contrasting viewpoints were environmental considerations.

To build a new motorway, large amounts of soil and rock needed to be transported to and from the construction sites. Critically, there were areas in which the new motorway would cause significant environmental disturbance, such as threats to several species (especially Siberian flying squirrels) and increased habitat fragmentation.

To manage the environmental impacts, several technical features, such as road tunnels and bridges for animals, were included in the project. Although there were also some environmental viewpoints in which the new motorway was a better alternative than the old road or the smaller improvements, the overall environmental disadvantages of MotorwayProject were assessed to be significantly larger. As the 2001 report summed up the environmental effects of the project, *"If the project is not implemented, nature will remain as it is. If the project will be implemented, there will be significant local disturbances."*

The contrasting viewpoints on issues such as safety, travel times, road capacity, and environmental considerations made MotorwayProject an illustrative example of difficult cost-benefit considerations. As was concluded in the 2001 report: *"because the analysis does not provide clear conclusions regarding the different goals, the weighting of the incomparable effects and the consequent conclusions remain largely the task of public decision making".*

The timeline of the project is illustrated in Figure 4. The different phases of the project are discussed in the following section.

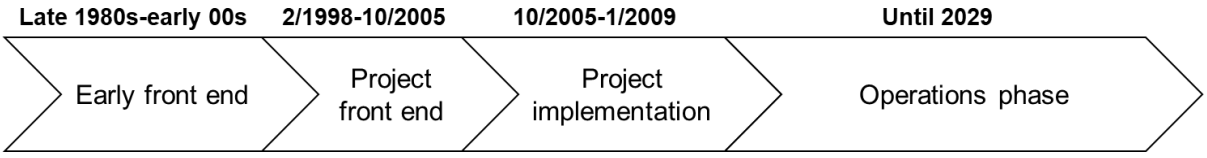

Figure 4. The timeline of MotorwayProject.

Project planning

As the previous section shows, the front end of MotorwayProject was quite long in its duration and included challenging periods of time. The history of the project can be dated back to at least 1989, when the first report comparing the different alternatives for improving the road was published. During the following decade, at least a dozen different reports and plans were created. Through these various reports and plans, the decision to build the motorway was made in 1998:

> *"There will be a motorway between Muurla and Lohja -- The Ministry of Transportation has approved an overall plan that defines the general location of the new motorway."* (Helsingin Sanomat, 5.2.1998)

The general plan approved in 1998 was very abstract in its nature. It did not, for example, consider the funding or the schedule of the project. However, the general plan enabled more detailed planning around the turn of the new millennium. The more detailed planning (i.e., road plans) took place in three phases, and the final road plans were approved in 2002. There were several appeals against the plan, but they were overruled in court in 2003. The appeals were mostly related to the environmental effects of the project.

After the appeals had been overruled, the remaining issue was the funding of the project. The parliamentary elections took place in Finland in spring 2003. Following the slow and quarrelsome preparations of MotorwayProject, the new government set a high priority for its development. However, there were also numerous other infrastructure projects competing for funding at the time along with other areas of the government program. The government decided to use the PPP model to facilitate the funding and initiation of MotorwayProject. In spring 2004, the government announced a supplementary budget with 700 MEUR funding for MotorwayProject. Of the 700 MEUR funding, 335 MEUR were estimated to be used in the construction phase.

The government's funding decision was preceded by preparatory work initiated by the Ministerial Committee for Economic Policy and the Ministry of Transport and Communications. A workgroup was formed in spring 2003 with the task of creating a proposal for "*the overall principles for maintaining and developing the transport infrastructure in Finland in the upcoming ten years, and the more detailed priorities for the ongoing governmental term*". The reports of this workgroup included a proposed investment plan for the upcoming years and the proposal for using a PPP model in MotorwayProject. The most important justifications for proposing the PPP model included:

- Positive experiences with the PPP model in Finland (the Järvenpää-Lahti motorway project) and internationally.
- The European Union promoted the use of lifecycle models for traffic infrastructure projects.
- Rapid implementation was considered particularly important for projects such as MotorwayProject. Because the service payments for the PPP consortium

begin only after the motorway is opened for traffic, it should motivate rapid project implementation.

- Potential for cost savings and improved service level.
- Preliminary calculations indicated the PPP alternative as the most economical alternative in comparison to traditional procurement.

Project procurement

The preparations for the competitive bidding process had been already started before the approval of the supplementary budget and funding for MotorwayProject. This enabled the formal bidding process to commence quite rapidly. The following goals were included in the invitation to tender in October 2004:

- Quick opening of the motorway to traffic.
- High-quality road maintenance service for road users.
- Improved traffic safety.
- Reduction of congestion.
- Optimal implementation of risk distribution (between the client and the PPP consortium).
- The most overall economic solution, even considering residual value.
- Sufficiency of order authorization for the entire contract period (i.e., covering both the construction and the whole operations phase).

Already in August 2004 it was announced that preliminary expressions of interest had been received from five consortia, all of which were considered suitable by the FTIA. The director-general of the agency *"was happy about the number of interested parties and the international backgrounds of the consortia"* (Helsingin Sanomat 17.8.2004). In addition to Finnish companies, the interested consortia included companies from the United Kingdom, France, and Spain.

After the preliminary call for expressions of interest, three consortia made official offers for the project. These included a Finnish-Spanish, a Finnish, and a Finnish-Swedish-British consortium. In June 2005, the FTIA announced that it would continue negotiations only with the Finnish-Swedish-British consortium called "Tieyhtiö Ykköstie Oy" ("Road Company Motorway One Ltd"). According to the agency: *"offers*

were received from three consortia, but the offer of Tieyhtiö Ykköstie was more inexpensive and significantly better overall." The agency continued:

> *"Considering both quality and price, this consortium had a significant edge over the competitors. We did emphasize also project schedule, but it was not a decisive factor. It was, nevertheless, a pleasant news that our preliminary schedule could be shortened by a year, as was the case in the previous PPP project."* (Helsingin Sanomat 16.6.2005)

When comparing the offers, the weighting for quality was 10% and 90% for price. The different project schedules were included in the price consideration.

The contract between the consortium and the FTIA was signed in October 2005. Although the maintenance costs of the operations phase were a bit higher than expected, the overall price of the contract was a bit lower than the budget provided by the government in the supplementary budget in spring 2004. The director-general of the FTIA discussed yet again the schedule improvements and emphasized how *"the new motorway will be built at a world-record pace"* (Helsingin Sanomat 28.10.2005). The director-general reminded of the safety implications of the new road and the consideration of environmental concerns in the project.

Project implementation

The project implementation began in early October 2005, slightly overlapping with the last phases of contract negotiation. This was mainly due to the demanding schedule promised by the PPP consortium. Other ways of pursuing rapid implementation included conducting preparatory work throughout the whole route and starting the construction work from both ends of the road (instead of only one end). For example, in December 2005, there was work under way in 20 different locations throughout the route. According to the CEO of the PPP consortium, the project schedule was *"demanding but completely viable"* (Helsingin Sanomat 6.10.2005).

The implementation phase began smoothly. In October 2006, after one year of construction, the project was assessed to be on schedule. Smooth progress continued, and similar estimates were made in June 2007 and in November 2007 as well. Still, in June 2008, less than half a year before the scheduled project closure, an

article in Helsingin Sanomat (5.6.2008) was entitled *“The new section of the E18 motorway will open in the autumn”.*

However, the problems began—or became public—in mid-November 2008. The new motorway was scheduled to be opened on a Saturday, but on Wednesday of the same week, the FTIA announced that only about half of the new road could be opened for traffic on schedule. The opening of the second half was delayed due to issues with testing the safety systems of the road tunnels. In mid-November, the delay was expected to be “several weeks”. Still, in mid-December, the representative of the Road Company was hopeful that the new motorway would open “before the new year”. However, the issues with the safety systems and the consequent delays continued, and the motorway was finally opened only in late January 2009, over two months behind schedule.

The delayed testing of the safety systems was not the only problem delaying the opening of the new motorway. In mid-December, a dangerous landslide took place, and the consortium was ruled to re-examine all the rock cuttings throughout the new route. A couple of days later, it was announced that two improvements to the rock cuttings had been made.

Small adjustments in the safety systems forced the motorway to be closed a few times in the early operations phase (March-May 2009) as well. Similarly, a few additional improvements to the rock cuttings were made in May 2010 to prevent landslides and improve road safety.

Operations phase

MotorwayProject moved into its operations phase in two steps in November 2008 and in January 2009. Similarly to SchoolProject, in MotorwayProject, a project company was made responsible for operating the motorway (Figure 5).

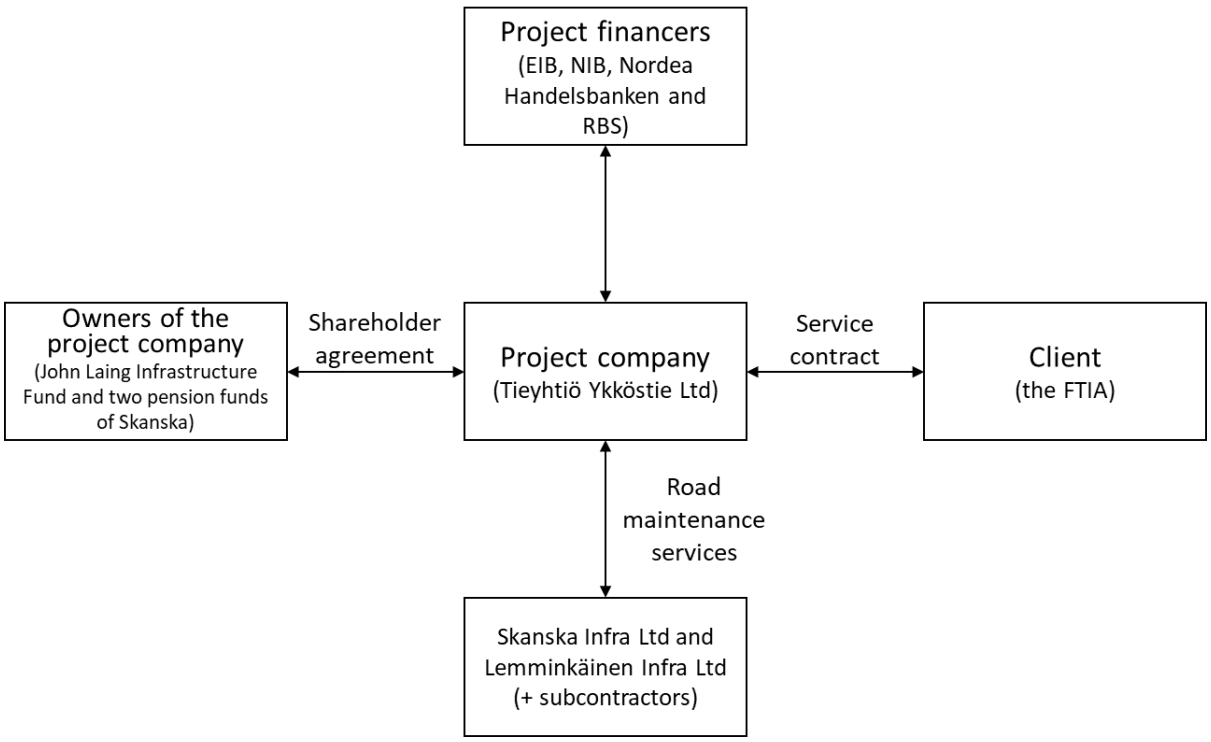

Figure 5. The main responsibilities of different actors in the operations phase of MotorwayProject.

The costs of the construction phase and service deliveries are covered by a service fee. The calculation of the service fees was tied to two overall variables: the availability and service level of the motorway. The calculation of the availability of the motorway is based on the flow of traffic and the scope (duration and timing) of possible disruptions. The assessment of the service level is based on the quality of the motorway maintenance.

With the service payments being tied to the opening of the motorway, the financial implications of the delayed project completion were significant. Consequently, arguments between the two actors began almost immediately and continued into spring 2009. Specifically, the PPP consortium and the FTIA kept blaming each other. According to the consortium, the FTIA made changes to the safety requirements quite late in the project, and the Road Company was not to blame for the delays. The FTIA disagreed with this view. As a representative of the agency stated:

> *"Even if there were some changes, the changes were quite minor and clearly part of the deal. The consortium has the responsibility for their schedule." (Helsingin Sanomat 31.1.2009)*

Public value in MotorwayProject

The previous sections have described the key events throughout the lifecycle of MotorwayProject. In this section, we conclude our findings from this example project by discussing the achievement of public value, by using the same framework as in SchoolProject covering financial value, service value, and systemic value.

Table 5. Public value in MotorwayProject.

Element of public value	Findings and learnings from the example project
Financial value: was the taxpayers' money used efficiently in MotorwayProject?	• There were competing opinions on whether the project was financially feasible, in comparison to a traditional public alternative. • The PPP model's role in promoting rapid project implementation was more widely accepted. Rapid project implementation is an important sign of efficient usage of taxpayers' money.
Service value: does the PPP delivery model secure or promote the provision of quality services and high service level in MotorwayProject?	• There were disagreements in the PPP service contract, both regarding requirements and responsibilities in the implementation phase, and the payment structure of the service fee in the operations phase. • The issues in the PPP contract led to delays in project completion and to arguments between the project parties, both indicating potential losses of public value.
Systemic value: how did the PPP delivery model enable and promote the initiation of MotorwayProject and related consequent public projects?	• Due to the size of the project, it is highly uncertain whether, or how much later, MotorwayProject could have been initiated as a traditional public procurement. • Several large PPP transportation projects have been implemented in Finland after MotorwayProject and there is evidence of learning between the consequent projects.

Concerning **financial value**, in many ways resembling SchoolProject, opinions were divided about the financial feasibility of MotorwayProject for the public sector, when comparing it to a traditionally funded alternative. Already in 2006, midway through the implementation phase, a study by Helsinki University of Technology considered MotorwayProject quite expensive (Helsingin Sanomat, 24.1.2006). A similar assessment was conducted by the Swedish Export Credit Corporation. In quite the opposite view, a Professor Emeritus from the Aalto University assessed in 2011 the

project being financially feasible and that *"the deal was very good for the taxpayers*" (Helsingin Sanomat, 21.3.2011).

Later, in a report published by the FTIA in 2014, the Road Company estimated that the construction costs of the motorway had been 300 MEUR. In its supplementary budget in spring 2004, the government had allocated 700 MEUR for this project, for which the costs of the construction phase were estimated to be 335 MEUR. It must be noted, though, that the estimates of the road company in the 2014 report are not comprehensively transparent.

Although the opinions about the financial feasibility of the project have been divided, the potential of the PPP model in promoting rapid project implementation has been more widely shared. The potential for rapid project implementation was one rationale for choosing the PPP model in the project front end as well.

The FTIA has emphasized the importance of rapid project implementation: *"We can't demonstrate direct cost savings, but important benefits will be reached from the faster opening of the motorway for traffic."* Quantifying the importance of rapid project implementation, in the 2014 FTIA report it was estimated that, based on the first five years of operation, the benefit-cost ratio of the project was at least 1.7. This analysis considered benefits such as travel times, traffic volumes, reduced congestion, and improved road safety. If the additional benefits of the PPP model, especially regarding rapid project implementation and potential budget savings, were included in the analyses, the benefit-cost ratio was estimated to be about 2.3. Although causality cannot be demonstrated here, these kinds of observations seem to indicate the potential of the PPP model in efficient project implementation.

To sum up this element of public value, there are some indications of the PPP project being financially more feasible than the public alternative. Opinions about this are quite divided, though. The potential of the PPP model in promoting rapid project implementation is supported by this project more strongly. The rapid project implementation can be considered a clear sign of efficient usage of taxpayers' money; in other words, the achievement of public value.

Service value has received little attention in terms of service quality in the operations phase of MotorwayProject. The road is in active and heavy use continuously.

However, a critical issue related to this element of public value is the structure of the PPP service contract. As discussed earlier, there were significant problems late in the project implementation phase, causing numerous delays to project completion. Although exact figures were never revealed to the public, it was estimated that the disagreement between the parties claiming each other was "*worth millions of euros"* (Helsingin Sanomat, 24.4.2009).

Due to the size of the project and the financial significance of these problems, several reports on the experiences with MotorwayProject have been published. The FTIA published a report on Finnish experiences with PPP projects in 2013 (FTIA, 2013). Regarding the problems in MotorwayProject, the report concludes: *"the requirements [regarding safety requirements, for example] were not coherently interpretable by all parties"*. In other words, the report implies that, at least partly, unclearly defined requirements promoted these problems. As this issue of disagreement was described earlier in a newspaper article:

> *"According to the road company, the company was forced to purchase additional surveillance cameras and safety equipment to meet the new requirements of the client. The company is expecting a payment for these extra works. The FTIA [client], on the other hand, argues that it has not demanded a specific number of security cameras, for example. It has only expressed a service level in terms of there being a comprehensive camera surveillance in all tunnels."* (Helsingin Sanomat, 24.4.2009)

Regarding the service level in the operations phase, the same 2013 report describes how the assessment of the variables defining the payment of the service fees was considered difficult by both parties: the client and the road company. Consequently, improved instructions for assessing the availability and service level of the motorway were created.

MotorwayProject illustrates some potential pitfalls of uncertainties and disagreements concerning service value in the terms of a PPP contract. These kinds of issues could endanger the creation of public value throughout the long lifecycle of a PPP project.

The potential of the PPP model in enabling and promoting urban development (i.e., **systemic value**) was evident in MotorwayProject in two similar ways as in

SchoolProject. First, it is highly uncertain, whether MotorwayProject could have been initiated as a traditional public procurement at all, or how long the project initiation would have been delayed. In projects such as MotorwayProject, this viewpoint is highlighted by the significant size large transportation projects. For example, when discussing MotorwayProject and a few other similar projects:

> *"If these three unique projects [MotorwayProject and two other possible PPP projects] were put under normal budgeting considerations, we would not build a single new road or railway in Finland during the following term of office"* (a representative of The Ministry of Transportation, Helsingin Sanomat 15.2.2003)

Second, several significant PPP transportation projects have been implemented in Finland after MotorwayProject. Importantly, there is clear evidence of learning between the consequent projects. For instance, as a learning point from MotorwayProject, there is a simpler service fee structure currently in place in the Kotka-Koskenkylä motorway project than in MotorwayProject, for example.

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Conclusions on public value from Finnish PPP projects

Achievement of public value through PPP projects

In the above chapters, we have presented examples from two Finnish PPP projects: a property construction project (SchoolProject) and a transport infrastructure project (MotorwayProject). Both projects were among the first PPP projects in Finland. In our view, it is impossible and even unnecessary to judge whether either of these projects was a clear success or a clear failure. Rather, both projects completed their primary mission, and both included a few unique challenges throughout their lifecycles. As the projects were implemented with a rather long lifecycle in mind, the estimates of success have evolved over time and it is difficult to say at what time exactly their complete success should be assessed.

The typical benefits of PPP projects discussed include rapid project implementation and financial feasibility (in other words, **financial value** and the efficient usage of taxpayers' money). The example projects provide clear support of the premise that the PPP model promotes rapid project implementation. Several reports have assessed that MotorwayProject opened for use exceptionally rapidly despite the delays late in its implementation phase. The rationale behind this thinking is of course the payment mechanism of the service fees.

The evidence of the financial feasibility of PPP projects is more mixed in nature. Especially in SchoolProject, there was quite a lot of discussion on whether the project was overly expensive and the financial feasibility of MotorwayProject was not universally agreed either. The financial feasibility of the PPP model is often justified by viewpoints such as innovativeness and efficiency of private sector firms. The two examples here demonstrate that the financial feasibility of a PPP project should not be considered self-evident but requires equally skilled project planning and management like any type of project. Another viewpoint that is often brought up by those critical towards the PPP model is that the payment logic of a PPP project creates a long-term financial commitment for the client, i.e., a municipality or country. Partly related to financial feasibility, there were issues of uncertainty in the contract terms in the example projects as well.

Even if there were uncertainties in the projects' financial feasibility, especially SchoolProject demonstrates potential for creating public value in terms of **service value**, i.e., delivering high quality services and service levels. Especially in this project, the arguments for the project having been overly expensive were many times responded to with arguments praising the high quality of the facilities. With PPP projects, the routines for lifecycle care and maintenance are already defined during project implementation and their responsibilities are defined quite early in the project, which has effectively resolved many issues concerning the latter lifecycle phases. By fulfilling the service level and quality expectations of the infrastructure owner, the PPP project will also serve the users and the public more broadly. However, as the service levels are tied to a long-term contract, the owner has limited if any control over the service level during the operations phase of the project. Thus, if the owner later faces financial difficulties, it may need to seek additional savings from other infrastructure assets. For example, regarding schools, the owner may need to further reduce the service level of schools completed with a traditional delivery model as it cannot achieve savings in a school tied to a service-level contract. If financial difficulties persist, this may, over time, lead to a significant gap in quality between these two alternatives. Furthermore, when looking at the financial difficulties of many Finnish municipalities today, PPP projects may provide financially weak municipalities additional options to enter to commitments that they cannot afford over the long term.

The diffusion of knowledge from these projects to later projects has paved the way to facilitate the creation of high service levels also elsewhere, far beyond the scope of the original projects themselves. We refer to this as **systemic value**. In Espoo, the city has implemented many similar projects since and expanded the model from new schools to school and kindergarten renovations. Typical reasoning behind the more recent PPP projects has been the prevention of indoor air problems, that is, ensuring quality and preventing maintenance debt through the payment mechanism of the PPP model. Regarding transport infrastructure, knowledge gained from the issues regarding the payment mechanism in MotorwayProject, for example, has been taken into account in latter PPP motorway projects.

The front ends of both example projects were characterized by a lot of discussion regarding the role of private funding in the delivery of public infrastructure. In both

examples, the supporters of the PPP model and later commentaries emphasized that the PPP funding model accelerated or even enabled the initiation of significant projects in public decision-making. For example, the following was stated in the draft decision of the city council meeting to decide on the initiation of SchoolProject:

> *"If the project is implemented as a traditional public procurement, there is a risk that the construction of the swimming hall and the sports hall will be delayed by years."* (Espoo city council, September 2001)

PPP projects and institutional change

The discussion above about the diffusion of knowledge has already touched upon the idea of PPP projects as sequences or portfolios of projects. In broader terms, we propose that the introduction and diffusion of the PPP delivery model in Finland can be understood as an institutional change process.

Development and institutional change with regards to the use of PPP and different institutional pillars has been driven by a sequence of PPP projects. The early PPP projects in Finland can therefore be considered institutional projects that, in addition to being shaped by their institutional contexts, were also actively shaping the widely shared rules, beliefs, and practices of appropriate project delivery arrangements among the public and private actors. Institutional work, particularly from the leading organizations within the field, such as the FTIA and research organizations, was also central in promoting the piloting of a PPP model.

PPP projects themselves can therefore be considered drivers for institutional change, where new contracting approaches, relational practices, and ways of organizing can be tested, developed, and further shaped. Both projects featured important PPP development work and the findings from the projects were taken into account in the forthcoming projects in Espoo and in Finnish road infrastructure. In addition, extensive preparation and capability development related to the use of PPP models was taking place at the industry level before their actual implementation, which included, e.g., the development of regulations and norms. In both example projects, there were significant institutional events that preceded the decisions to initiate the PPP projects. In SchoolProject, illustrative examples included the city's previous strategic decisions to increase the role of the private sector in the delivery of public services and the 1999

study on the applicability of the PPP model for public property construction projects in Finland. In MotorwayProject, a similar event was the report on the principles for maintaining and developing the transport infrastructure in Finland, which also included the proposal to implement MotorwayProject as a PPP project. We argue that decisions or events like those aforementioned enabled or at least promoted the decisions to implement the two projects as PPP projects.

Our analysis, with regard to institutional change and its different layers, shows how changes in the regulative, normative, and cultural-cognitive elements related to PPPs in Finland are produced through the micro-level activities of the actors in the different projects that are shaping the field. In addition to these project-level activities, the structures and sequence of development programs at the industry level bridging the learnings from different PPP projects were highly central in advancing such change processes. However, further understanding of how institutional change is unfolding through changes in regulative, normative, and cultural-cognitive elements as well as how their interplay and change dynamics contribute to the change process is essential.