

# Choosing State Owned Enterprises over Public-Private Partnerships for Infrastructure Governance

Explaining Institutional Change with Evidence from Denmark's Transport Sector

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# CHOOSING STATE OWNED ENTERPRISES OVER PUBLIC-PRIVATE PARTNERSHIPS FOR INFRASTRUCTURE GOVERNANCE: EXPLAINING INSTITUTIONAL CHANGE WITH EVIDENCE FROM DENMARK'S TRANSPORT SECTOR

Lene Tolstrup Christensen and Carsten Greve

## ABSTRACT

*This paper shows why State Owned Enterprises (SOEs) are sometimes preferred over the more known Public-Private Partnerships (PPP) in infrastructure governance contrary to the academic debate and policy focus the last two decades. The Danish case of transport infrastructure governance is examined focusing on the road and the rail network where a new modern SOE model is developed and used in mega projects. This paper uses theories of historical institutional change focusing on path dependency and the gradual change mechanisms of layering and conversion to analyze the institutionalization of the SOE model and to argue how and why it excluded PPPs. The SOE model was chosen at a critical point in time when the PPP model was starting to grow in other countries. The SOE model combines a professional board and management with financing via state guaranteed-loans and user charges. The SOE model was layered on the existing agency model for public provision of transport infrastructure and became locked-in for new mega-projects. Combined with a general lack of institutional support for PPPs and a strong national economy the PPP model in Danish transport infrastructure governance was excluded. The paper contributes to the renewed academic interest in SOEs and the results are relevant to other countries coping with public-private mixes in infrastructure governance.*

**Keywords** – *public/private partnerships, transport infrastructure, state owned enterprises.*

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## **INTRODUCTION: WHY CHOOSE A STATE OWNED ENTERPRISE OVER A PUBLIC-PRIVATE PARTNERSHIP?**

This paper focuses on why State Owned Enterprises (SOEs) are sometimes preferred over the more known Public-Private Partnership (PPP) model in building and financing new transport infrastructure. Infrastructure governance is a vital element in today's economic growth debate (OECD, 2015b). The European Union has recently launched an "Investment Plan for Europe" to boost the development of European infrastructure (European Commission, 2014). Transport Infrastructure is considered a main element in economic growth as it creates mobility in a society (Sclar, 2005) and transport infrastructure is the largest sector for PPP projects in value terms in Europe in 2014 (European Investment Bank, 2015). The academic debate on infrastructure governance in the transport sector has been dominated by the Public-Private partnership (PPP) model for several decades (Hodge et al., 2010, Roumboutsos, 2016) and many transport infrastructure projects have also been characterized as mega projects (Flyvbjerg, 2014, Priemus and van der Wee, 2013). The state owned enterprises (SOE) model has been there all along, but there is little knowledge on how modern SOEs work (Grossi et al., 2015, Florio and Fecher, 2011, Bruton et al., 2015), and how and why the SOE model has developed to secure its place in transport infrastructure governance. The paper contributes to the growing literature on contemporary SOEs in public governance by analyzing SOEs in relation to the PPP model in the area of transport infrastructure governance. The research questions are: How do models for infrastructure governance change between SOEs and PPPs in the transport sector? Why has Danish transport infrastructure governance preferred the SOE model over the PPP model?

We examine the case of Denmark where a modern SOE model is used for key transport infrastructure megaprojects in the roads and rail network. Denmark does not seem to have integrated the PPP model in infrastructure governance compared to other European countries (Hammerschmid and Ysa, 2010), but in some other areas than transport the PPP model has been used (Petersen, 2010) and it has been up for political discussion over time. Denmark is regarded as one of the most efficient economies which may point to why new private finance was not needed. The case of Danish transport infrastructure may shed light over why SOEs persisted while the PPP model stalled in infrastructure governance. To examine the research questions and analyze the Danish case, this paper

uses theories of institutional continuity and change in historical institutionalism and focuses on gradual change via the processes of path-dependency (Pierson, 2004) layering, and conversion (Streeck and Thelen, 2005, Mahoney and Thelen, 2010, Conran and Thelen, 2016). The paper shows that a new ‘modern SOE’ model for megaprojects was chosen at a critical point in time where PPPs were starting to boom in other countries, but was not introduced in a Danish context. The modern SOE model was ‘layered’ on the existing public provision of transport infrastructure. This ‘modern SOE’ model with a professional board, state guaranteed-loans and user charges (“statsgarantimodellen”) became “locked-in” for transport infrastructure projects and increasing returns have appeared in using the modern SOE model. Combined with a strong national economy, this development has had consequences for new choices for both mega-projects and transport infrastructure provision in general in Denmark where PPPs have challenged the modern SOE-model, but never succeeded in becoming an alternative.

**POLICY INSTRUMENTS IN TRANSPORT INFRASTRUCTURE  
GOVERNANCE: STATE-OWNED ENTERPRISE AND PUBLIC-PRIVATE  
PARTNERSHIP IN AN INSTITUTIONAL CHANGE PERSPECTIVE**

There are several policy instruments of infrastructure delivery that governments can choose among in the provision of infrastructure from government-ownership to the inclusion of market actors in governance practices (Salamon, 2002). Market-based governance is the term used by Donahue and Nye (2002) for the inclusion and adoption of market mechanisms in governing public affairs. OECD (OECD, 2015b) has recently provided a useful overview and distinguishes between 1) Direct (public) provision, 2) Traditional public procurement, 3) State-owned enterprises (in full or in part), 4) Public-private partnerships and concessions, 5) Privatization with regulation (OECD, 2015b, p.2). Infrastructure governance is here defined the following way: “By the governance of infrastructure is meant the processes, tools, and norms of interaction, decision-making and monitoring used by governmental organizations and their counterparts with respect to making infrastructure services available to the public and the public sector. It thus relates to the interaction between government institutions internally, as well as their interaction with private sector, users and citizens. It covers the entire life cycle of the asset, but the most resource intensive activities will typically be the planning and deci-

sion-making phase for most assets. More specifically it refers to the delivery modality and the public and private sectors (...)" (OECD, 2015b, p.2).

Where the academic attention the last decades have been focusing on the market-based governance models in contracting-out (Kettl, 1993), privatization (Hodge, 2006) and PPPs (Hodge et al., 2010), OECD's focus on more state-oriented policy instruments in infrastructure governance follows a newly academic recognition that the last decades of public management reform has not only led to more market-based governance, but in some countries more state control (Greve et al., 2016, Pollitt and Bouckaert, 2011, Van de Walle et al., 2016) and thus a variety of public-private mixes (Wettenhall, 2010). In this line a renewed academic interest in SOEs has seen the light across disciplines as there is little knowledge on how modern SOEs work (Florio and Fecher, 2011, Bruton et al., 2015, Grossi et al., 2015) and empirically it turns out that SOEs are used to a large extent in infrastructure governance (OECD, 2014). Next to this PPPs as an infrastructure model has had different national trajectories (Hammerschmid and Ysa, 2010) and has lost popularity in infrastructure projects on the backdrop of the financial crises where private finance dried out (Greve and Hodge, 2013). This paper breaks new grounds by analyzing SOEs as a part of the reasons why PPPs as a model of infrastructure governance has not become influential in some countries and thus bridges the two distinct academic literatures on PPPs and SOEs respectively. As the OECD (2015b) overview shows there are more infrastructure models in play, but for the purpose of this paper, the focus is primarily on the SOE model and the PPP model, but in the presentation of the Danish case of road and rail network other models are also mentioned if relevant.

**State-owned Enterprises (SOE)** have through history been used by governments in situations with a lack of market or for strategic reasons (Farazmand, 2013, Wettenhall, 1998). Milward (2011) adds concerns for social and political unification and national defence as reasons for why state ownership has been chosen historically. SOEs can be seen as a policy instrument to obtain both social and economic goals (Thynne, 1994) and it had its peak in Europe from the 1940's till 1980's especially in the network industries (Parker, 2003, Milward, 2011). There is a variety of forms of SOEs from purely state-owned with statutory status to mixed ownership forms and public limited companies and efforts have been made to create sound typologies (Wettenhall, 2003, Van

Thiel, 2012). The development, organization and reasoning for using SOE differ and often follow national trajectories (Greve et al., 1999, Van Thiel, 2012). In network industries, state ownership of infrastructure has been seen as the prominent governance model to secure a sufficient level of maintenance and equal access (Baldwin et al., 2012). A report by OECD (2014) shows that half of all SOEs are in the network industries. However, state ownership has at the same time been criticized for a lack of efficiency and on this background many SOE were privatized (Parker, 2003) or corporatized especially in the Anglo-Saxon countries (Wettenhall, 2001) as a part of broader public management reforms (Pollitt and Bouckaert, 2011) where new policy instruments based on private sector or third part involvement were explored (Salamon, 2002).

**Public-Private Partnerships (PPP)** became a policy instrument for governments in the early 1990s in earnest. PPPs are “long term contractual arrangements between a government and a private partner whereby the latter delivers and funds public services using a capital asset, sharing the associated risk” (OECD, 2012). Most reports date the beginning of modern day PPP in infrastructure projects to the British government’s Private Finance Initiative under John Major in 1992-1993. The British government wanted to encourage more infrastructure projects in order to modernize a run-down UK public sector. The government wanted to let private finance come to the fore to avoid having to use the public sector borrowing requirement. The UK made an updated policy on PPPs (PF2) and a recent review of the UK experience of PPPs has been made by the OECD (2015a). A PPP is organized as a design-finance-build-own-operate-transfer (DFBOOT) or variants thereof (Duffield, 2010). The public sector and the private sector enter into long-term contracts, share risks and aim to achieve mutually acceptable objectives. Since the 1990’s, the policy for PPPs has spread to many areas of the world, including USA, the rest of Europe, Latin America and most recently to India and China (Hodge eds, 2010, OECD, 2008, OECD, 2011). PPPs have come to the forefront of the policy agenda in Europe after a decline in the aftermath of the global financial crises where private capital dried out. 82 PPP deals in infrastructure projects were signed in 2014 (European Investment Bank, 2015). However, PPP as a policy instrument has had different trajectories in the EU (Hammerschmid and Ysa, 2010) and reservations remain among the member states.

When analyzing infrastructure governance as a choice between different policy instruments there are broadly two strands of literature. A public economy account that approach the political choice of given policy instrument as the result of finding the optimal and economically most viable model (Del Bo and Florio, 2012, De Bettignies and Ross, 2010) and an institutional approach choices are seen as a result of a historically and country dependent process (Pollitt and Bouckaert, 2011). The institutionalist literature is centering on the question of institutional continuity and change. In a recent article about how to distinguish different institutional approaches Koning (2015) encourages scholars to distinguish between endogenous or exogenous change and to explore a sequential approach to its full potential. This paper follows this sequential approach and examines change mechanisms in an historical institutional perspective. The paper combines two strands of historical institutional explanation namely a focus on path dependency that emphasizes stability (Pierson, 2004) and gradual transformation that highlights change (Streeck and Thelen, 2005, Mahoney and Thelen, 2010).

The focus on path dependency (Campbell, 2004, Pierson, 2004) look for critical junctures and path dependencies. From the path dependency viewpoint, once a policy instrument emerges from a critical juncture when many options were open, further developments are “locked in” and set on a certain institutional pathway and create institutional stability. Pierson (2004) famously focused on four types of policy feedback types that lead to increasing returns. They are (1) large set-up costs, (2) learning effects, (3) coordination effects, and (4) adaptive expectations. Actors get used to a certain institutional path once they acknowledge the initial costs in setting up a program which is the subsequently difficult to alter; they learn from practicing the institutionalized way of handling matters; they minimize costs because coordination departs from well-known principles; and most of the actors involved in the field will adapt their practice to the expected institutional structure. This is called the “lock-in” argument where vested interests and power is at play. There are interests who will have a stake in keeping the institutional arrangement going and will defend the model against other models. Several interests may protect that specific policy instrument and work against new policy instruments that challenge the existing order.

The path dependency approach has been supplemented by later contributions in on historical institutionalism. While regarding path dependency as one way institutional change occur as abrupt change, most prominently Streeck and Thelen (2005) have focused on more gradual change mechanisms such as displacement, layering, drift, conversion and exhaustion (Mahoney and Thelen, 2010, Streeck and Thelen, 2005). The perspective suggests that a path is not completely sealed off, but can be subject to gradual change processes over time that is driven by ongoing interpretations and meaning making processes of the formal institution by influential actors that potentially can lead to major change. The change mechanism *layering* is when new institutional elements are ‘layered’ on the existing institutions because the institution cannot be changed. *Drift* is when an institution keeps its formal integrity, but is ‘drifting’ away from the original intentions. Layering and drift are likely to occur when strong veto players are at stake as the old institution is not changed. *Displacement* is when institutions are tired out from inside by strategic actors that endogenously tries to replace old institutions with new ones. *Conversion* is when a formal institution is redirected towards new goals. *Exhaustion* is when an institution is breaking down gradually due to time as a changer. When we examine the infrastructure development in the Danish road and rail network we thus study the different infrastructure governance models as policy instruments in an institutional perspective. We both focus on critical junctures and the subsequent path where one of the policy instruments is chosen over others, but when analyzing the subsequent path we not only expect stability, but we pay attention to the different mechanisms of gradual change by studying how the policy instruments are institutionalized over time. A criticism sometimes raised against institutional theories is that they become engaged in too many historical details and “thick description” which do not make room for single-factor explanations. This paper aims to get into the empirical variety of organizational forms so we stick with the more detailed approach which will be described in the following section.

## METHODOLOGY

This section focuses on how the empirical investigation of the Danish case has taken place. Guided by the theoretical framework and its insistence on documenting institutional features of infrastructure governance and how they change over time, we set out to map the institutional elements of the Danish transport sector focusing on megapro-



jects where SOE-models have been used in order to provide an overview not found anywhere else in the literature. This is the case with bridges and tunnels organized in Sund & Baelte A/S and the Copenhagen Metro I/S. The paper first describes the overall political and administrative organization of the overall transport infrastructure area. Then we describe the models of infrastructure delivery understood as the main financial and organizational model that is used to provide infrastructure (OECD, 2015b) that are in play for roads and rail network respectively to understand the institutional context in which the SOE model develop. In the case of the Copenhagen metro both infrastructure and service provision will be described as they are to some extent integrated in the contracts. In the discussion section we then discuss and analyze, how and why the SOE-model for megaprojects and PPP are been institutionalized differently in a process of path dependency and layering and conversion.

To conduct this analysis we examined the websites under the Danish Ministry of Transport both for the historical and current overall organization of Danish Infrastructure and for how the transport projects are organized for roads and rail networks respectively. Most of the relevant data was available on the internet. We supplemented this database with data from annual reports and formal strategies and government reports on the organizations in question. When possible we also used reports from the National Auditor Office to identify discussions and background on the selection of policy instruments both regarding choosing and the rejection of new policy instruments in an area. Based on this database we then analyzed the sequence in which the transport infrastructure projects occurred in line with the suggestion from the institutional change literature by constructing both detailed organizational charts for overview and relations and time lines for each area to follow the potential process of institutional change. Next to this we followed the general debate on PPPs in Denmark the last 10 years and attended meetings, conferences, conducted interviews and other research activities that provided us with insights into key actors like the Ministry of Finance position on the question of PPPs in general.

In the following overview of the Danish case we show how the main infrastructure within road and rail network in Denmark is delivered via state agencies that contract out the construction work, but finance it over state appropriations. Next to this, a new SOE model with state guaranteed loans for mega projects became institutionalized early on

and “crowded out” the possibility for PPP model for in transport infrastructure governance. Combined with the fact that the Danish state had financial resources to withstand the need to choose the PPP model we show how elements of the PPP model has been tried and also adapted to some extent in the new SOE model, but always based on public finance (through state guaranteed loans and user charges) and full control.

## **DEVELOPMENTS IN THE INFRASTRUCTURE GOVERNANCE OF THE DANISH ROAD AND RAIL NETWORK**

The responsibility of the transport sector in Denmark is based in a national Ministry of Transport that is also responsible for the coordination with other levels of government. As a member of the EU, Denmark is obliged to implement EU-regulation and policies related to the transport sector. The Danish Ministry of Transport consists of a Department, a number of executive agencies, independent councils and state-owned companies. The Department is responsible for the policy formulation, management of the ministerial area, strategic planning and the drafting of laws. The executive agencies are in charge of specific and technical issues of implementing and administering the transport legislation and policy, but also responsible to plan and deliver the infrastructure. The independent councils are dealing with accidents, complaints and monitor the competition situation. The SOE's are independent organizational units owned fully or partial by the state, but managed and run by independent Board of Directors and Management Boards. Both the Danish regional and the local municipal level are also responsible for parts of the transport policy and infrastructure governance e.g. the municipalities are responsible for the main part of the road network, the regional transport organizations are tendering public passenger bus services and owns train infrastructure and service companies.

The involvement of different public authorities is also the case in relation to the general policy development of SOEs and PPPs in Denmark. The overall responsibility of the SOEs is in the Ministry of Finance, but within the transport sector the ownership is placed in the Ministry of Transport. In relation to PPPs the policy has been spread out

on different ministries and has not resulted in a coherent policy and regulation framework (Petersen, 2010). Today the Danish Ministry of Business and Growth with the Danish Consumer and Competition Authority in the forefront are responsible for advising public organizations on tender processes and PPP. However, the Ministry for Economic Affairs and Interior, the Danish Ministry of Transport and the Danish Ministry of Finance are to some extent also working with PPP. As Petersen points out, the use of PPP in Denmark has been marginal also in relation to transport infrastructure (Petersen, 2010), but since 2010 the PPP model has been introduced and tried out in other areas than the transport sector, notably in schools and for infrastructure facilities for new court houses. In the following, the road and rail network will be described to show the dynamic of each area and how a modern SOE model for mega projects developed in each area.

### **ROAD NETWORK**

The Danish road network is publically owned and is coordinated from the Danish Ministry of Transport with the Danish Road Directorate as responsible agency for the state owned roads that also holds a general sector responsibility for the road sector in Denmark. The road network is divided into the state road network which consists of motorways and some highways which is around 5 % of the total network, but with a 45 % share of the total traffic work. The municipalities are responsible for the rest of the network, where some of it is privately owned roads that are publically accessible. The Road Directorate and the municipalities are working on the planning, construction, maintenance and enlargement of the road-net. The road net is financed through state appropriations. Both the Road Directorate and the municipalities' administrations are tendering all the construction and maintenance work of the roads to private companies. Thus the main infrastructure governance model for the road network is what OECD term direct (public) provision in terms of planning and finance with traditional public procurement in the construction and maintenance of the road net.

Once, the Road Directorate did try to introduce the PPP model as well. In 2009, the Road Directorate did the first and only PPP-tender for a road construction project the so-called 'Kliplev-Sønderborg'- motorway based on a Build-Operate-Transfer-model

(BOT). The Road Directorate took over a project from a county that was merged into a new region in Denmark. In 2010 the contract was signed with a Danish-Austrian consortium KMG. The Danish state owns the road throughout the project, but the private part is responsible for the construction phase in all its aspects and the following maintenance all in all a 30 year contract. The construction phase was finalized one and half year before schedule and the project is considered a success both by the Ministry and the municipality. Despite of the success, the Ministry has not used the PPP-model in other road construction cases either on state or municipality level.

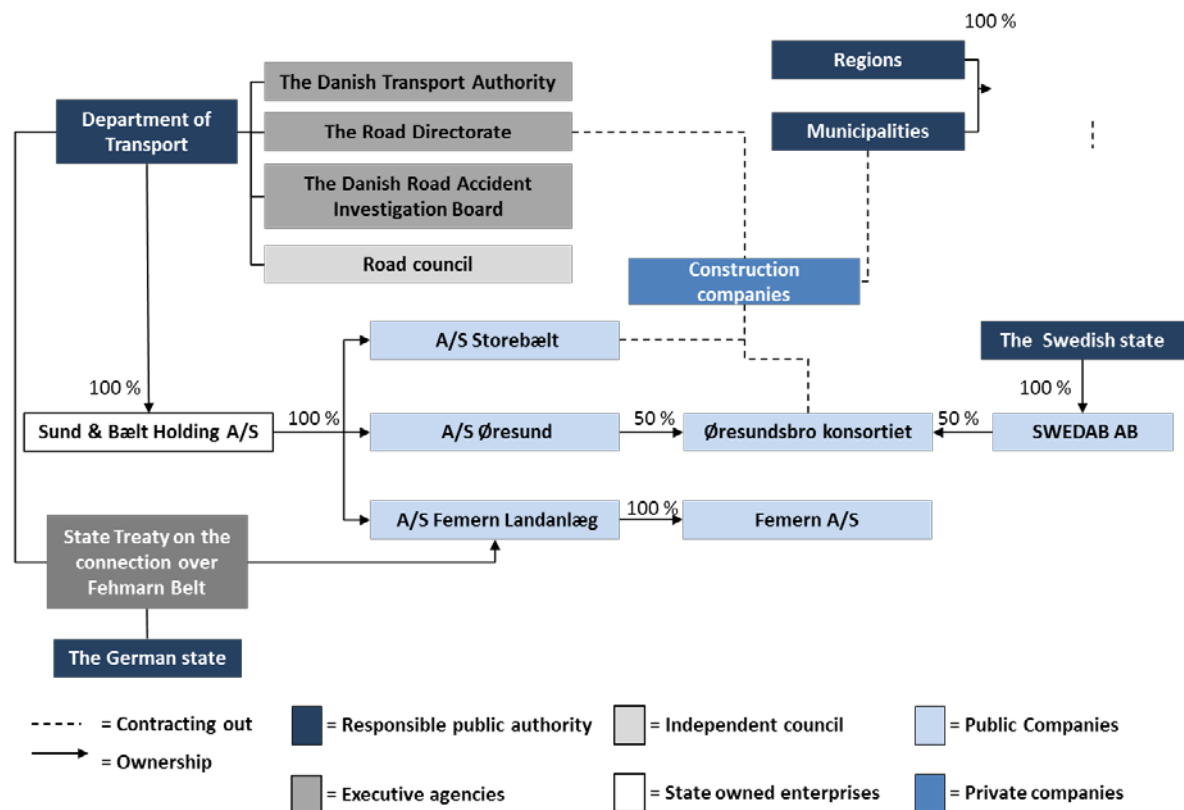
More prominent is the development and institutionalization of a new modern SOE model for mega projects of bridges and tunnels. Bridges and tunnels are normally under the regulation and organization of the road network, but some of the biggest infrastructure projects in Danish history are bridges and tunnels to secure better connection between the main islands and later to the neighboring countries Sweden and latest Germany and these have been governed through the SOE 'Sund & Baelte Holding A/S'. Today, the company is responsible for the operation and maintenance of the two bridges the Great Belt Bridge and the Øresund Bridge and the construction of the future Fehmarn Belt Tunnel between Denmark and Germany.

The development of this model began in 1987 when the Danish parliament decided to build the in total 18 km long highway and railway connection the Great Belt Bridge. In this period the Danish State faced budget constraints and it was decided in order to finance it, that the organizational and financial model should be a SOE that could take up state guaranteed loans on the international capital market and that the bridge should be paid by user-charges. The actual construction work was contracted out to entrepreneurial companies and was carried out over a period of 10 years and the connection opened in 1997-98. The project was considered a success both by the population and the politicians due partly to higher traffic volumes than forecasted and lower cost of interest rates than expected. The same model was used in the construction of the 16 km long Danish-Swedish highway and railway connection the Øresund Bridge. A consortium equally owned by the Danish and Swedish state was made and it was financed through state guaranteed loans and paid by user-charges. The construction of the bridge was decided in 1991 by the Danish and Swedish governments and later the respective parliaments. The construction work was contracted out to engineer companies and it opened in 2000.

Again an unexpected high increase in the transport work and lower interest rates than expected has made the bridge a success.

The successful cases have institutionalized a model in the area of tunnel and bridges on major projects based on the SOE 'Sund & Bælt Holding A/S'. The model is called an SOE with a state guaranteed loan ("statsgaranti-modellen") and also involves user charges and has been described in detail by Sund & Bælt (2014). The institutionalization becomes clear in the current project of building the Fehmarn Belt Tunnel between Germany and Denmark where a PPP-model was discussed, but abandoned in favor of a the SOE on the Danish part of the connection. Hence, even though the bridges are financed by user-charges, the PPP-model has not been used in the projects and the private sector involvement has been limited to contracting-out of the construction and maintenance work (Sund & Bælt, n.a.).

**FIGURE 1 illustrating the infrastructure governance of the Danish road network**



## RAIL NETWORK

The rail sector has been heavily reorganized since the 1990's where the national Danish transport operator DSB was split up leading to the unbundling of passenger rail service and rail infrastructure. This development has been a part of liberalization process of the sector and has been further strengthened by EU-regulation(Christensen, 2015) . The Ministry of Transport is responsible for the general regulation and policy development of the sector. Rail Net Denmark is the responsible agency for the overall responsibility for planning, maintaining and modernization of the Danish railway and signal system infrastructure. The Department of Transport is also responsible for the partial ownership of 'Metroselskabet' which is responsible for the Copenhagen Metro. Next to the national rail network and the metro, there are regional based publically owned rail companies that maintain and operate so-called 'local' networks. The municipalities own the companies either directly or through public regional transport companies.

The rail network is all publicly owned and is financed mainly through state appropriations. In 2003 the Rail Net Agency responsible for the rail net was turned into an SOE Rail Net Denmark with its own board of directors and management board and the purpose was to make the organization into a 'production company'. All agency-related tasks were moved to a new agency the Transport Authority that became the regulator in the rail sector. In 2006, the corporatization of the Rail Net Denmark was intensified with the political agreement of turning a part of the company into a public owned limited company Enterprise A/S with the purpose of a partly privatization of up till 25 % of the shares. In 2009, the corporatization of Enterprise A/S was set on hold due to financial problems in the company. The company stopped its commercial activities and was integrated back into the Rail Net Denmark. In the beginning of 2010, the corporatization of Rail Net Denmark was suddenly rolled back completely. The board of directors is discharged and the organization is turned into an agency and put under direct reference to the Minister. This event also leads to reorganization of sector where the coordinating role of the rail sector and the planning of rail projects are moved from the Transport Authority to the Rail Net Denmark once again.

In 2009, an Infrastructure Fund with the value of 11, 9 billion Euros was founded with the purpose to coordinate all future infrastructure investments across modes of transport and the first program of investments had a clear focus on the rail network. This focus

was further strengthened in March 2013, when the present government unexpectedly decided to establish a Rail Fund with a value of 3,7 billion Euros on further rail infrastructure investments. For PPP related matters, this was a missed opportunity in the sense that private finance opportunities were not explored, let alone chosen. Thus the main infrastructure governance model for the rail network is what OECD term direct (public) provision in terms of planning and finance with traditional public procurement in the construction and maintenance of the rail net. This model seems to be reinforced with the establishment of special rail infrastructure fund where mega projects like a new national signal program will be handled within the existing model of direct public provision with traditional procurement of the construction and maintenance.

However, on the municipality level there has been a prominent example of the use of new modern SOE model for the mega project the establishment and operation of the Copenhagen Metro. On the municipal level, the metro in Copenhagen is organized in a SOE 'Metroselskabet I/S' (Metroselskabet) owned by the Danish State and the two municipalities in the inner Copenhagen area<sup>1</sup>. The Company has the responsibility for the operation and the development of new metro lines, but the actual construction and operation are contracted out. The decision to make a metro or light rail was passed in parliament in 1992 and in 1996 after a tender process the company Copenhagen Metro Construction Group was awarded the construction of the network and the Italian transport company 'Ansaldo STS' (Ansaldo) was awarded the deliverance of the train fleet system. Ansaldo also won the contract to operate and maintain the metro and re-won the contract in the second tender round. The actual operation and maintenance of the metro has in both cases been contracted out by Ansaldo to 'Metro Service A/S' (Metro Service)<sup>2</sup>. Hence, it was a contracting out model, but with PPP element because of the integration of delivering infrastructure in terms of the fleet and transport system combined operation and maintenance. This also goes for the Metro's second phase Cityring that was passed by the parliament in 2007. Ansaldo won the contract to deliver

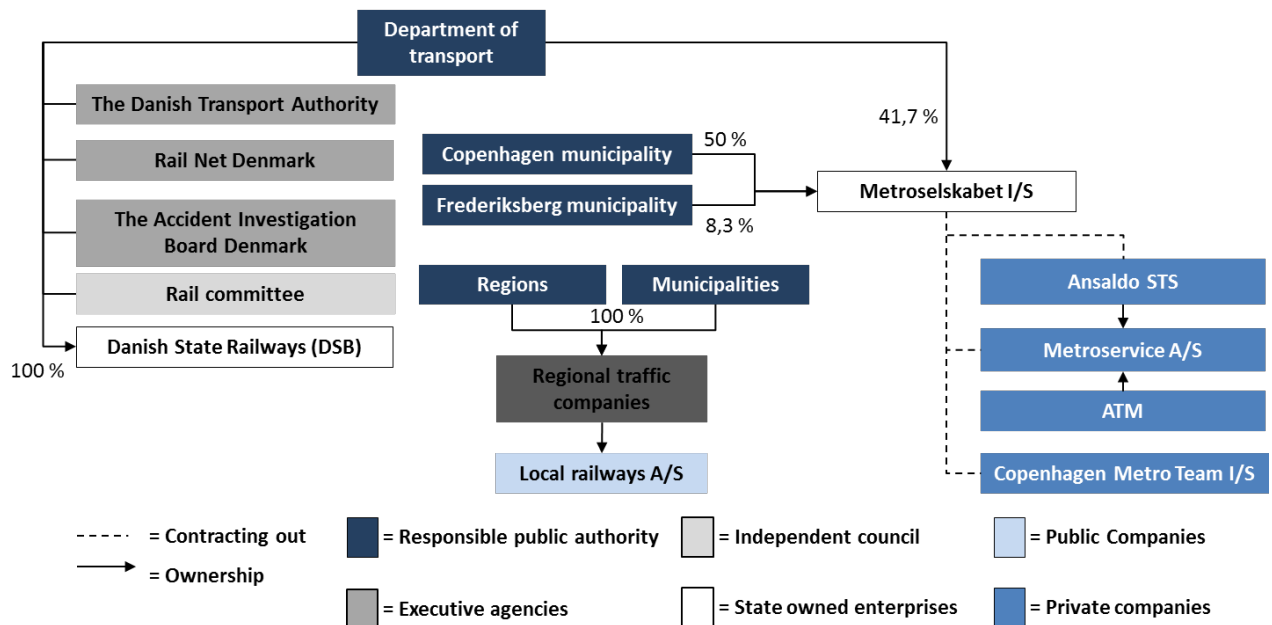
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<sup>1</sup> Ownership; 50% Copenhagen municipality, 41,7 % the Danish State by The Ministry of Transport and Frederiksberg municipality 8,3 %

<sup>2</sup> Metro Service A/S was founded in 1998 and is owned by International Metro Service which is owned by ATM (Aziende Trasporti Milanese) and Ansaldo ATS

trains, system technology and infrastructure plus the first 5-8 years operation and maintenance of the metro line. The construction of the tunnels and stations was awarded to ‘Copenhagen Metro Team’. So though the metro is being financed and owned by the state and the municipalities, the construction of the infrastructure and the operation is handed over to a private partner that has been involved in the metro since the very beginning. The Metro has been a success in terms of passenger satisfaction, reliability and passenger growth.

**FIGURE 2 illustrating the infrastructure governance of the Danish rail network**



**DISCUSSION: MODEL FOR A MODERN SOE**

The Danish case shows that there are different models of infrastructure governance in use in the supply of road and rail network infrastructure. The main part of the transport infrastructure is provided via a public model as direct (public) provision where agencies or municipalities are responsible for the planning and delivery of infrastructure that is financed via state and municipality appropriations combined with traditional public procurement where the construction and maintenance is contracted out to private engineering companies. This point to that the Danish government over the period studies has had the finance needed to build its infrastructure via direct public provision. However, from a governance point of view there are more reasons to engage with other new policy instruments than pure economic concerns namely to obtain efficiency and innovation



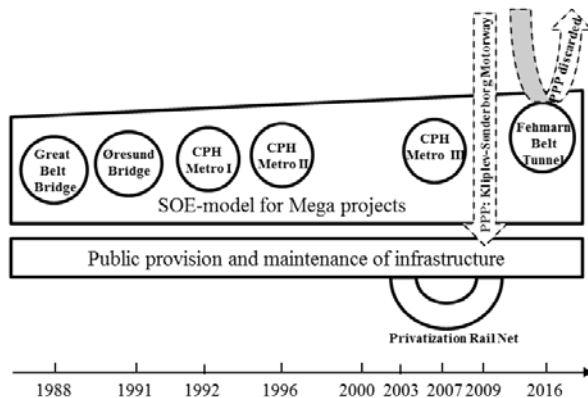
from private parties (Klijn, 2010) and in line with the general development in western European public management reforms (Pollitt and Bouckaert, 2011, Greve et al., 2016) other infrastructure models have been tried out in the Danish case.

In line with the general policy development in Denmark in the 1990s where many old SOEs were sold off or reformed, the rail sector underwent major reforms including initial privatization (sale of assets) (Christensen, 2015). In relation to the rail network a corporatization of Rail Net Denmark was started combined with a privatization process of parts of Rail Net Denmark. However the privatization process was stopped and Rail Net Denmark was later turned back into agency form. This can be seen as an endogenous institutional transformation where existing models of infrastructure governance are *converted* to new models of infrastructure governance. What is interesting is that the conversion of Rail Net Denmark is reverted back into an agency model. In 2009 and again in 2013, ear-marked public infrastructure funds were invented with the purpose of financing new mega projects in the rail network excluding the PPP model. As such PPPs have not been explored in the area of rail network where the direct public provision combined with traditional public procurement of the construction and maintenance work has been institutionalized.

In the infrastructure governance of the Danish road network there is one example of a (moderated) PPP, but the model has not been developed further or used elsewhere, but there is an extensive use of a new modern SOE model that has proved to be resilient and continues to be a preferred model of infrastructure governance for new transport mega projects. This model was invented when the Danish economy was weaker and the new SOE is the responsible planner and provider of infrastructure where the mega projects are financed based on state guaranteed loans and user charges, and the construction work is mainly contracted out to private engineering companies. A version of this model is also found in the case of the mega project Copenhagen metro as a part of the rail network where the finance was based on state guaranteed loans and sale of land rights combined. To answer the research questions on how models of infrastructure governance change between SOEs and PPPs in the transport sector and why the SOE model is preferred over the PPP model in Danish transport infrastructure governance the following sections will in a historical institutional perspective first discuss the institutionalization of new modern SOE model for mega projects and second how this support the re-

jection of PPPs in Danish transport infrastructure governance. The institutional change processes in Danish infrastructure transport governance for the road and rail network are shown in figure 3.

**FIGURE 3 The institutional change process of Danish transport infrastructure governance**



#### INSTITUTIONALIZATION OF THE MODERN TRANSPORT SOE

*The first event* that sparked off the interest in the new modern SOE model for mega-projects was the decision by parliament in 1988 to build a new Great Belt Bridge in Denmark. This was the most visible megaproject in a long time, but also a project that had been on the cards for decades, but which no government had been able to get through with and public finance was scarce at that point. To establish this megaproject the government decided to establish a new independent SOE with mainly government board members and a management from the public sector. With this model it became possible to finance the project via government obtained loan using the Danish government's credit rating as security and the users were to pay off the loan via user charges. The bridge itself was to be constructed by contractors to the SOE. This model became known as the "statsgaranti-modellen": an SOE with a professional board, state guaranteed loans and coupled with the introduction of user charges (Sund & Bælt, 2014).

*The second event and third event* followed each other closely. In 1991, parliament in Denmark and parliament in Sweden voted for building a bridge across Øresund. They

used the same model that had been established with the Great Belt Bridge; an independent SOE with board at arms' length from government and a professional management, state guaranteed loans and user charges. Later on the two project-based companies on the Danish side were organized in the umbrella SOE Sund & Bælt A/S that further institutionalized the layered element of mega-projects. Next to this, in 1992, the parliament decided on another mega-project in the shape of a Copenhagen metro (light rail) system. Here the organization was a joint venture between the Danish state and the Copenhagen municipality and Frederiksberg municipality. The company was established as an SOE (I/S) where both state and the municipalities had ownership. The actual construction of the metrosystem and the later daily management of the metro lines were contracted out to an Italian contractor. The finance model was built on sale of public owned real estate in an area of Copenhagen where available land was ripe for development. These events in 1991-1992 cemented the SOE with state guaranteed loans-model for transport infrastructure megaprojects in Denmark. The new SOE model became the preferred one within a short (5 years) span of time. They employed the same features: An SOE model with a professional board and management, and a financing model resting on a state guaranteed loan, introduction of user charges and for the Metro sale of land rights.

*The fourth event* was when the Metro was going to have an extension –project, the so-called Metro Ring. This megaproject was being shaped in the way of the already existing Metro-project. After a bidding round, the same contractors were even chosen to perform the task of building the actual infrastructure and running the Metrorail service.

*The fifth event* was when the discussion on the Fehmarn Belt megaproject began to emerge. The Fehmarn Belt connection will connect Denmark and Germany through a tunnel and/or a bridge. There was consideration of a PPP solution, but after initial calculations by a consultant company, the idea was abandoned, and the preferred model has been the SOE model with the Danish government (for the Danish side of the project) obtaining a state guaranteed loan and making users pay through user charges over a 30+ year period. Once again, the new modern SOE model prevailed in transport infrastructure governance with the same kind of organizational and financial model.

Seen from an analytical perspective of institutional change theory the new modern SOE model for mega-projects was institutionalized upon the existing agency model for infrastructure governance as a new institutional *layer*. The new layer consists of new project-oriented organizational forms, introduction of user-charges and state-guaranteed loans on the commercial market. It never threatens the old agency model, but we will argue that this layered SOE model became “locked-in” after it was first used for the Great Belt Bridge and create a form of path-dependency that excludes new layers e.g. PPP as a model in infrastructure governance. The path dependency takes place through Pierson (2004)’ feedback types. As a mega project there were large set-up costs that had to be paid back from the model itself over a long period of time. Next to that there were learning effects as the SOE model was progressively being adjusted and eventually the two companies building the bridges were connected in one company (Sund & Bælt) which led to coordination effects as Ministry of Transport could govern and negotiate with the same board and management of the SOE across more mega projects. This made the new SOE model flexible and easily manageable for the government. In this line Sund & Bælt (n.a.) argues that fewer transaction costs are used in the SOE model than in the PPP model with complex contracts and risk management schemes. When there have been controversies – for example with noise complaints in the Metro system leading to an extension of the completion date, or the exact pricing of the user charge – the government has been able to negotiate with the SOE to find a solution. There is however no knowing of the counterfactual claim that the presence of private finance would have gotten the actors to act in a different way, and maybe find savings in the budget rather than just postponing completion. What we argue is that the institutionalization of this new layered SOE model for mega projects in transport infrastructure governance creates an institutional path dependency in transport infrastructure governance in general that excludes PPPs as a model in new transport mega projects even in moderated forms. This will be elaborated on in the next section.

#### **THE REJECTION OF PPP AS NEW SEPARATE MODEL OF TRANSPORT INFRASTRUCTURE GOVERNANCE**

In 2009 the Danish Road Directorate tried a version of PPP with a BOT model when they decided to build a new piece of motorway between Kliplev-Sønderborg. The Road Directorate did not come up with the idea for a PPP, but took over a project from a county. Despite the success in terms of finishing before time and on budget, the model is not further replicated. The county who originally had enthused about a PPP was not in existence anymore, and the Road Directorate did not feel a need to pursue a policy towards PPPs. As it could have been an attempt of layering where a new model is layered upon the existing, it does not lead to any major change in the public provision of transport infrastructure in Denmark that stays public organized and financed.

Next to that private sector actors came to realize that when the Metro project was decided and later the Fehmarn Belt (although that has taken a lot longer to agree on), that private actors had to adapt to the SOE model with state guaranteed loans and user charges, because this was the preferred model for the Danish government. Suddenly shifting to a private finance model, and giving up the interests from the state was not going to be viable. Key stakeholders in government and in SOEs all had a vested interest in keeping the SOE model going, and private finance injections into the finance model would alter that situation. Therefore, private finance was not used in the transport megaprojects in Denmark. The SOE model with state guaranteed loans and user charges therefore do not seem to be challenged easily. Later, the robust Danish economy has made it unnecessary for the Danish state to experiment with PPP. When other countries began to experience with the PPP model in the 1990's and 2000's, the Danish transport mega-projects were already "locked-in" to the SOE model with state guaranteed loans and user charges.

The lack of support for PPPs in transport infrastructure governance follows the general picture about PPPs across various Danish governments during the last two decades. Where the UK and other countries have PPP units staffed with professional expertise (OECD, 2011), Denmark has not had a comparable, specialized PPP unit in the powerful Ministry of Finance. Instead PPP guidance has been offered by a small office in the Competition and Consumer Authority which is an agency within the Ministry of Business and Growth. PPPs have been on the agenda in the Danish Productivity Commission (2013), but the commission's recommendations and other reports have been ignored. The Ministry of Transport does not seem to prioritize knowledge on

PPPs. In 2014, the Danish government published a report on infrastructure investments (Danish Government, 2014) was published, but Denmark is still a long way from other countries more elaborate policy planning for infrastructure.

### **CONCLUSIONS: SOE AS A SUBSTITUTE TO PPP IN TRANSPORT INFRASTRUCTURE GOVERNANCE**

Based on the puzzle why SOEs prevail after decades of policy focus on PPPs in transport infrastructure governance this paper has analyzed and explained the development of a modern SOE model in transport infrastructure governance in Denmark. Using theories of historical institutional change, the analysis shows a number of models for infrastructure governance in Danish road and rail network and that a new modern SOE model was *layered* on top of the predominant agency model when the first transport mega-project was decided in the late 1980s where public finance were scarce. Subsequent decisions on further transport mega-projects in quick succession therefore used the modern SOE model as inspiration. The modern SOE model consisted of an independent SOE with professional board and management and a finance model consisting of state guaranteed loans and user charges for bridges and tunnels and exploitation of land use in the case of the Metro. The paper points to a sequence of five events that has institutionalized the new modern SOE as a layered model for mega projects in transport infrastructure governance, which, it is argued, created a path dependency via policy feedbacks that excluded PPP as a viable model in transport infrastructure governance in Denmark. Next to that there has in general been a lack of institutional support in Denmark when it comes to PPPs that together with Denmark's economic status as an AAA-economy made private finance through the PPP model less relevant.

The paper contributes in three ways to current debate in public policy and management. First, it contributes with an empirical overview of the various models for transport infrastructure governance in Denmark within road and rail network and how they institutionally evolve and relate that show the relevance of analyzing public-private mixes (Wettenhall, 2010) when understanding infrastructure governance today. Second, espe-

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cially in relation to the PPP literature it reveals how the PPP model can be rejected in a modernized public sector as the Danish one where alternative new models closer to traditional public infrastructure delivery can exclude PPPs. Based on this the paper thirdly makes an important contribution to the call to understand contemporary SOEs (Bruton et al., 2015, Grossi et al., 2015, Florio, 2014a) by supplementing current explanations that SOE prevail because of mixed-ownership as hybrid organizations (Bruton et al., 2015) or because of financial performance, emergency role for the state, privatization reversal or international expansion (Florio, 2014b). The paper shows the development and use of a *new* 100% SOE is perceived to outperform marketized solutions. The paper's conclusions are relevant in other countries where public models prevail over market-based infrastructure governance and point to the importance of focusing on SOEs and other public models in infrastructure governance and thus on policy level to update and rethink the policy for SOE-models in future infrastructure policies.

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