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Technical networks' ownership,
governance and procurement

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Authors Maila Herrala, Pekka Pakkala and Harri Haapasalo	Type of publication Research report	
Name of the report Technical networks' ownership, governance and procurement		
Abstract <p>Communities' technical networks such as electricity, heating, water, sewage, telecommunications and transport networks have traditionally been owned and operated by public sector. Current economic theories and market situation, however, argues that many public utilities and services can be delivered more efficiently when private sector is involved or when fully privatised. Privatisation, public ownership and public-private partnerships have all found their supporter and opponents over the years. The literature related to ownership and governance of technical networks is, however, patchy and sector and mode specific.</p> <p>This paper presents a literature review on models considered to be suitable for arranging technical networks ownership and governance. It concentrates on defining and modelling the different ownership and governance structure variants and models for technical networks. Objective is to create a coherent picture of the different ownership models, their prerequisites, disadvantages and benefits and the structural changes made during the 20th century. It describes different alternatives from which the municipalities and state authorities are able to determine the preferred structure for each situation. Different approaches should be analysed and weighted in order to find the best possible solution. It has been observed that one size does not fit all and one needs to carefully make conclusions before undertaking any paradigm change.</p> <p>This research is part of a more extensive research project named <i>C-Business – Communities' technical networks ownership, governance and operation</i>, which aims to investigate the pros and cons of different ownership and governance models of communities' technical networks. The project assesses the public and business risks of different O&G models and defines a common frame - business architecture - to these models. It further attempts to point out the weak and strong points of both market-oriented and public models of the networks, and to identify prospective business potential in operating and owning the networks. This paper gives a good starting point for further research in the area of ownership, governance and partnerships.</p>		
Keywords infrastructure, governance, privatisation, public-private partnerships (PPP), procurement		
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List of definitions

DBFO / Concession	<i>Design-Build-Finance-Operate.</i> Private investor or contractor design and construct a facility and operate and maintain it for a certain time. After the contract period the contract might be renewed or responsibility is transferred from the concessionaire to a government agency.
BOT / BOOT	<i>Build-(Own-)Operate-Transfer.</i> Private investor design, finance, construct, operate and maintain a facility for an agreed-upon time. After limited term of ownership the ownership is transferred to public sector at no cost.
BOO	<i>Build-Own-Operate.</i> Private investor design, finance, construct, operate, maintain and own a facility for an agreed-upon time. The ownership remains in the hands of the private operator even after the expiration of the contract period.
MOC	<i>Municipal-Owned Company.</i> Operate as commercial business under Limited-liability Companies Act. Do not have societal obligations like and receive no government or municipal financial support.
MOE	<i>Municipal-Owned Enterprise.</i> Business unit, for which local council has defined the state of (financial) independence.
OECD	Organization for Economic Cooperation and Development
PFI	<i>The Private Finance Initiative.</i> A procurement mechanism by which the public sector contracts to purchase quality services on a long term basis so as to take advantage of private sector management skills incentivised by having private finance at risk.
PPP	<i>Public-Private Partnership.</i> Partnership between the public sector and the private sector for the purpose of delivering a project or a service traditionally provided by the public sector.
SOC	<i>State-Owned Company.</i> Operate as commercial business under Limited-liability Companies Act. Do not have societal obligations like and receive no government or municipal financial support.
SOE	<i>State-Owned Enterprise.</i> Business unit, for which government has defined the state of (financial) independence.

1 Introduction

Communities' technical networks such as electricity, heating, water, sewage, telecommunications and transport networks have traditionally been owned and operated by public sector. Some public goods, such as road networks have been provided to users through direct or indirect taxes. Other infrastructure networks are typically paid according to actual usage/consumption, fees and other indirect charges. Infrastructure networks have typically been provided by public owners. Current economic theories and market situation, however, argues that many public utilities and services can be delivered more efficiently when private sector is involved or when fully privatised. The private sector is said to bring stronger managerial capacity, access to newer technologies specialised skills and more flexible and rapid response to changes in the world markets (Rondinelli 2003). Also, opposite opinions has been presented stating that public ownership or public-private partnerships are more efficient under certain circumstances.

The literature related to ownership and governance of technical networks is patchy and sector and mode specific. This paper concentrates on defining and modelling the different ownership and governance structure variants and models for technical networks. Objective is to create a coherent picture of the different ownership models, their prerequisites, disadvantages and benefits and the structural changes made during the 20th century.

1.1 History

The rise of the public ownership took place at the beginning of the 20th century. Economics supported government ownership if any market inequities or imperfections such as monopoly power or externalities were in sight (Shleifer 1998). The general belief was that government could protect the companies from market powers and secure the post-war service provision of socially important commodities (see e.g. Taylor 2006, Perotti 2004). These ideas lasted for several decades until the reform and economic transformation took place at the end of the 1970s. Continuous protection, rent seeking and customs barriers had to give way to profit maximisation and efficiency acquired through private sector involvement (Olsson 1999).

The wave of privatisation started in the 1980s with the UK government taking the lead under Prime Minister Margaret Thatcher's watch. Privatisation spread rapidly worldwide when previously nationalised infrastructure networks were transferred to private ownership in many countries. However, privatisation confronted several obstacles during and after the process such as price raises, deterioration of quality, self serving management, et cetera. It was also gradually realised that privatisation does not always lead to lower costs, better quality or more efficient production (Willner 1994) because of the private sectors 'unbeneficial' objectives to strive for cost minimisations and other inappropriate goals from the public viewpoint. Privatisation processes are still going on in some developing countries, but in industrialised world it has declined little by little. In the latter countries, private sector involvement is being used in different forms when emerging

economic theories and financing instruments suggest that methods such as public private partnerships might be more beneficial in the provision of public services.

Public private partnerships started to gain ground in the 1990s when the difficulties confronted in the privatisation process became clearer and when it was understood that purely public provision is not efficient either. The partial inclusion of private sector in different projects and in the provision of public services provides the possibility to take advantage of the strengths of both the public and the private sector. Private sector is thought to bring more competitive and economical efficient operations while public sector emphasises social responsibility and accountability (Jamali 2004).

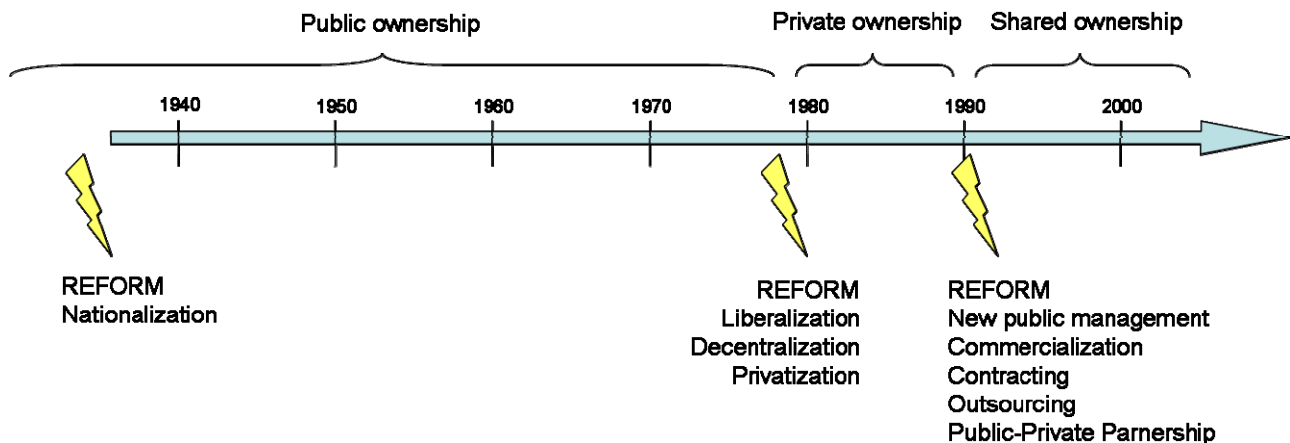


Fig. 1. Reforms and development of ownership

Politics has always had a large influence over public service provision. Infrastructure development, kinds of public goods demanded, and roles played by private firms has over the years been shaped by the values of politically important actors and the workings of governmental, political, and legal institutions. For example in the US, regulatory, franchising and contracting arrangements have been influenced by the opinions of how “public” the various goods and services are. When the service has been seen as predominantly as “private”, the private service provider is able to make decisions about price, output and quality of the service. When the service instead has been seen as public, these decisions have had to be made by government agencies, regardless of the role played by the private sector. (Jacobson and Tarr 1995)

1.2 Ownership and governance

In general, term ownership means exclusive rights and control over property. The question of property rights can, according to Olsson (1999), be divided into three functional types. First is the right to exercise control over the property and determine how the property is used. Second is the right to benefit from the asset through its usage or lease. Third is the right/obligation to bear the consequences if the net value of the property changes. Alchian and Demsetz (1973) and Alchian (1993) add that property rights also give right to sell, give up or exchange the property and exclude others from using it. In this work, exclusion and transferability are considered the most important characteristics of property rights, if the resources are to be used in the most productive way. In the case of exclusive and freely transferable property rights, owner has always incentives for maximising the value of the asset, since he has full right/obligation to the residual income/loss ensuing from the use of the asset or capitalising the value by selling the property (Olsson 1999).

The transferability of property rights makes it also possible to separate and dynamically specialise ownership and control (Olsson 1999). This separation, from the owners to the management, have

been executed and discussed widely. Although it can bring benefits, it also introduces problems such as the agency problem. Agency theory consider the question of what kind of mechanism makes possible an agent (management) to act in congruence with principal's (the owner's) objectives under conditions of asymmetric information and diverging interests (Alchian and Demsetz 1973). Beatty and Zajac (1994) further identify two distinctive viewpoints in agency theory literature: 1) a normative principal-agent literature emphasise the design of compensation contracts with optimal risk-sharing properties and 2) a positive (more empirical) literature that focuses primarily on questions related to the separation of corporate ownership and control and the role of boards of directors. The agency problem and the separation of ownership and control thus introduce the question of corporate governance.

The definition of corporate governance in our study is taken from Organization for Economic Cooperation and Development (OECD): "*Corporate governance is the system by which companies are directed and controlled, in the interest of shareholders and other stakeholders, to sustain and enhance value.*" It is thus the array of external and internal control mechanisms that motivate corporate executives to make decisions that are expected to enhance firm's value and/or the wealth of its major stakeholders (Watson 2005). It is a question of the use of property rights for the benefit of all shareholders and in other words, the way investors assures themselves return on their investments (Shleifer and Vishny 1997). Good governance is transparent, accountable, participatory, efficient and fair (see e.g. Weiss 2000, OECD 2003). CIPFA and OEM (2004) have written "The Good Governance Standard of Public Services" which is directed to the public agents using public money in the UK. These principles are, however, applicable to several types of organisations and include the following six statements.

Good governance means...

- focusing on the organisation's purpose and on outcomes for citizens and service users
- performing effectively in clearly defined functions and roles
- promoting values for the whole organisation and demonstrating the values of good governance through behaviour
- taking informed, transparent decisions and managing risk
- developing the capacity and capability of the governing body to be effective
- engaging stakeholders and making accountability real

Corporate governance is especially important when the ownership and control is separated. (Fama and Jensen 1983) This is the case for example when ownerships is divided between many parties or when shareholders or the owners do not run the company but have a separate management team to take care of the daily activities of the company (Olsson 1999, Ooghe and De Langhe 2002). Corporate governance is also important when the board of directors ratifies and monitors important decisions and makes collusion between top-level decision management and control agents more difficult (Fama and Jensen 1983).

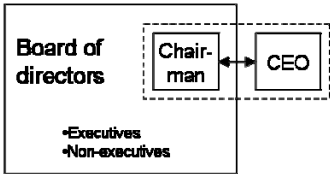
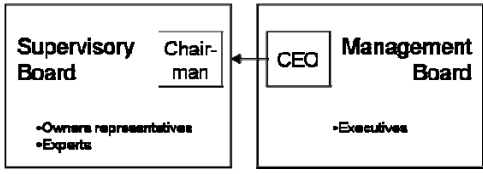
Corporate governance demands to find and establish institutions and mechanisms which can reduce the costs arising from the separation of ownership and control (Olsson 1999). Governance is about information sharing between owners and managers so that owner can trust management to make reasonable decisions from owner's viewpoint and maximise profit. As Olsson (1999) states

Without functioning governance it will not be possible to take advantage of the positive effects accruing from specialization in ownership -- and management -- since capital ownership simply would not dare to part with their capital and put it into ventures which are run by other people who have better information on the actual happenings within a firm and thus are in a position to use this money in many ways other than to maximise profit.

There are few methods how principals (owners) can affect the agents so that they work according to the benefits of the owner. In situation where property rights are traded these are called 'voice' and 'exit'. If owner wants to exert his/her influence through 'exit' he/she sells shares of the underperforming firm which may then lead to the membership's decline and revenue drop. This makes it more difficult and costly for the firm to raise capital and the firm's low price opens it for potential hostile take-overs and replacement of the management. If the owner exerts his/her influence through 'voice' instead, he/she can take active part in management and in the case of mal-performance, may lead the company to owner-initiated change of management. In both of these cases the management is engaged in search for the ways and means to correct whatever caused the customers and members dissatisfaction. (Hirschman 2004) Other mechanisms are effective disclosure requirements, competition in product and managerial labour market and influence through capital market. (Olsson 1999)

From two abovementioned mechanisms of control ('voice' and 'exit') and the geographical location of operations, two governance systems can be introduced: Anglo-American model (shareholder model) and Continental European model (stakeholder model). The main differences between these two models are in the shareholder concentration and identity, liquidity of the stock market and interlocking ownership (Ooghe and De Langhe 2002). These and some other differences can be found in the Table 1.

Table 1. Differences between Anglo-American and Continental European governance system models (Ooghe and De Langhe 2002, Becht and Röell 1999, Franks and Mayer 2001)

	Anglo-American model	Continental European model
Shareholder concentration	Low concentration of shareholders which incurs that there is only a small group of management who can make decisions and exert power. This might lead to over investments and lower profitability to shareholders.	Few shareholders who hold large percentages of the firm's shares thus the control is dispersed to a large number of anonymous investors with a variety of interests.
Where	e.g. the United States and the United Kingdom	e.g. Germany, France, Italy
Ownership	Shares are in the hands of the agents of financial institutions (over 50 %) rather than private persons. Dispersed ownership.	Shares are mostly held by private companies (20-40 %), financial institutions and private persons. Concentrated share ownership.
Board structure	One-tier board 	Two-tier board 
Discipline mechanisms	External discipline mechanisms like take-over market and competition which are introduced from outside the company.	Internal discipline mechanisms, like board of directors or compensation contracts are introduced from inside the firm.
Time horizon	Short term orientation	Long-term orientation
Main potential conflicts of interest	Between managers and dispersed shareholders	Between controlling shareholder and powerless minority shareholders

Ownership and corporate governance models are strongly interrelated. The differences in corporate governance models are related to the way ownership and control is organised (Ooghe and De Langhe 2002, Franks and Mayer 2001) and changes in ownership structure also change the corporate governance (Robbie and Wright 1995). The ownership structure, and thus corporate

governance, can and should vary according to the changing efficiency of fiscal structures, the evolving financial structure of the government budget, and to the interest rates level changes (Rosa 1993). On the other hand the ownership structure is also expected to correlate with the strength of the firm's internal mechanism of corporate governance (von Nandelstadh and Rosenberg 2003).

According to Franks and Mayer (2001) when there is concentrated ownership there should be more active corporate governance than in the case of dispersed ownership. However, study by La Porta et al. (1999) reveals that ownership concentration is in fact often associated with weak rather than strong corporate governance when more active corporate governance should be introduced.

It is thus the selection of correct ownership, control and governance (the last mediating between the first two) package which defines the performance and efficiency of the enterprise and its operation (Figure 2). These three can be determined as a consequence of decentralisation, outsourcing, privatisation, commercialisation, incorporation and public-private partnerships which are discussed later.

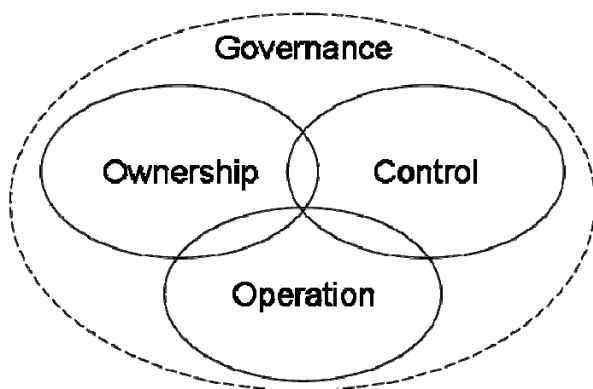


Fig. 2. Ownership, control, operation and governance

2 Public ownership variations

The prime of nationalisation and public ownership in Europe started after the World War I when public demand for greater social control over markets followed a series of devastating financial crises such as hyperinflation, stock market crash, banking crises and the Great Depression (Perotti 2004). After the World War II public ownership of infrastructures became the rule when state wanted to control the private monopolies in order to limit the abuse of market power and because private sector did not have enough incentives to invest in public utilities (Taylor 2006).

There are several arguments which are used to justify state ownership. The most often cited is the presence of market failures. According to Välilä (2005) the public sector should intervene in the provision of infrastructure services when 1) the producer has the power to influence price setting in a way that the market price of commodity is above the social optimum and the quantity transacted below it; 2) in the presence of externalities (e.g. noise or pollution) where the production or consumption of a commodity have a spill-over effect on third parties; 3) in the case of public goods which are characterised by non-excludability and non-rivalry in consumption; and 4) in the case of merit goods which individuals do not consume sufficiently to ensure their own welfare (e.g. education). Intervention does not, however, always mean pure public ownership, but more direct regulation and control instead.

Perotti (2004) discusses the issue of market failures and arguments that public ownership is also justified if there is evidence of either public or private commitment problem. Former means that the government is unable to commit to market-friendly tax and regulation policies and latter that regulators have difficulties in controlling significant decision made by private owner. Problems exist mostly because of incomplete information, incomplete contracts and incomplete legislation. Perotti (2004) also argues that state ownership is superior when it is costly to renegotiate procedures with private parties and when explicit regulation is difficult to implement because of non-verifiable contingencies. Shleifer (1998), Perotti (2004) and Välilä (2005) all agree on the fact that public ownership is justified when there is a significant opportunity for cost reductions to have a detrimental, non-contractible, impact on the quality of the service and when technical innovations are unimportant or government employees have strong incentives to innovate. It was felt that government could bear the risks of operations better and it had the capital raising capacity for development and planning of public utilities. It was also expected that public ownership would bring social benefits such as increasing employment and reliable delivery of essential services but also serve strategic interests (Hemming and Mansoor 1988). Willner (1994) adds that public ownership can also support anti-inflationary policies by price controls and this way minimises economic damage.

Shleifer (1998) argue that although government ownership might be superior in the abovementioned cases with a benevolent government, the principal case for privatisation rests on the distortions in the non-benevolent government's objectives. Inefficiency of government ownership might be a result of the government's deliberate policy to transfer resources to supporters to maintain political

support (Shleifer and Vishny 1994) or for enterprises' use government ownership to pursue political goals of which communism and corruption are good examples (Shleifer 1998).

Throughout the world, infrastructure networks have dominantly been owned by public sector. For example in the USA water networks were originally in private ownership but most of them were transferred to public provision at the beginning of 20th century remaining that way ever since. State ownership has also dominated for example telephone services in France, Germany, Switzerland, and other European countries. (Jacobson and Tarr 1995)

2.1 Different public ownership and governance models

When considering what kind of public ownership model to pursue one should consider at least the following three things (Sarin 1998):

1. *The nature of the service*: Is the commodity/service socially important? How important it is for the government to guarantee the provision of the service? What are the social objectives of the service?
2. *Quality of service*: What is the best way to guarantee the quality of the service for customers? Should the provision of collective undivided service be turned into hands of state/municipal enterprise or state-owned enterprise?
3. *Competition*: Can the market be opened for competition? Is it possible to introduce competition for example in the case of natural monopoly?

In Finland there are three public ownership models with different levels of government intervention (Figure 3), namely civil service department, state/municipal enterprise and state-owned company.

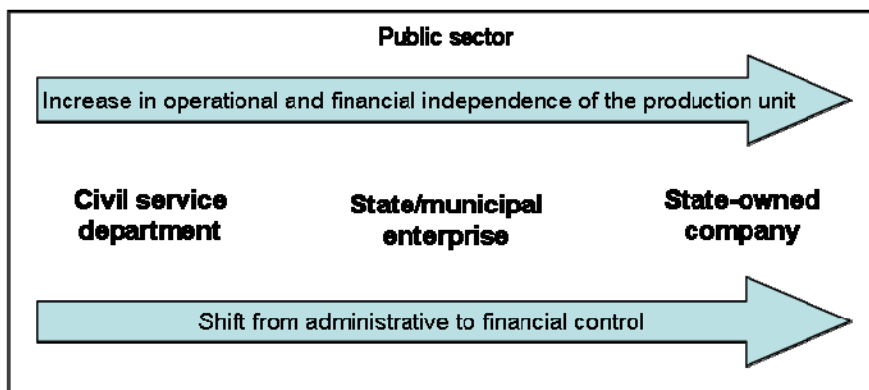


Fig. 3. Public ownership

2.1.1 Civil service department

Civil service department is integral part of state or local government.

Gross budget department works under income transfers received from government or municipalities. Department cannot collect payments to finance its operation and usually it cannot adjust its expenses to attain profitability. (Kähkönen 1996) Financing of gross budget departments are decided in the Ministry of Finance according to each departments own budget calculations. The main power of gross budget departments remains in the hands of the Parliament. (Sarin 1998)

Net budget department has more financial power than gross budget department and usually the starting point is self-profitability. Net budget department needs to have a defined income source,

normally from user fees, in addition to income transfers from the state or municipalities in order for it to function under the principle of full-cost recovery. A net budget department budgets the difference of revenues and expenses to the revenue side of budget if revenues are larger and to the expense side if expenses are larger. This is legislated in budgetary act. Instead of having only activities relating to public law, a net budget department might also have some commercial activities. In such a case, the Department's activities are usually limited to at least some partially restricted customer groups. A net budget department cannot take loans and it cannot lend to others. The department is headed by a chief (executive) officer who is responsible for all activities. The department has also a board whose members consist of the management, the relevant Ministry and other stakeholders. (Kähkönen 1996, Heikkinen et al. 1996) The state or the municipality is carrying all the risks.

Examples of net budget departments in Finland are Finnish Road Administration (Finnra), Vehicle Administration (AKE), and Finnish Communications Regulatory Authority.

2.1.2 State/Municipal owned enterprise (SOE)

State/municipal enterprise is a state (SOE) or municipality owned (MOE) business unit, for which government or local council has defined the state of (financial) independence. Enterprise has a power to decide on everything that has not been excluded in the regulations, and thus can autonomously design and operate its business operations and investments. State enterprise has both business and societal objectives and obligations. Council of State or relevant Ministry set the state enterprise's yearly profit targets and because these enterprises works usually in competitive markets they also need to develop its product to have demand. (Heikkinen et al. 1996) Although SOEs/MOEs are fully owned by the state or municipality, their budget is separated from state's/municipality's budget and their operations are mainly financed with payments received from customers. Public ownership ensures that state/municipality can reap the benefits of operations and at the same time have democratic control over the operations. (Kähkönen 1996, Heikkinen et al. 1996, Jalkanen et al. 1996)

The parliament has the power to decide on SOEs maximum amount of investments although only rarely these basic investments are interfered. SOEs can take loans from financial institutions for investments and expenses with long-term effects and for financing permanent increase in the working capital. Because state-run enterprise is part of state it cannot go bankrupt. Council of State nominates the board and the chief executive officer (CEO). The CEO is responsible for the operations under the guidance of the board. The board comprises of representatives from relevant Ministry, employees, business experts and other stakeholders. State enterprise also has its own chartered accountants. The Parliament, Council of State and relevant Ministry are taking care of external steering. (Heikkinen et al. 1996)

This ownership model has been seen as a step away from strict public ownership and step towards state-owned company (SOC) and possible later privatisation. Public ownership should be transferred to SOE or SOC if external turnover covers the full costs (Kähkönen 1996) and if the enterprise or company is expected to make profit and to provide reasonable return on capital to state or municipality (Jalkanen et al. 1996).

There are a few differences between SOE and MOE. First, the municipal enterprise's operational conditions are regulated with the organisation-specific laws. Second, municipal enterprises can not establish subsidiary companies like state enterprises. Third, usually the state enterprise is the first phase of incorporating operations, but in municipalities it is more often complementary to a limited-liability company. (Heikkinen et al. 1996)

Kähkönen (1996) made an analysis on the benefits of state enterprises on the basis of interviews. The main benefits were financial effectiveness, improved cost awareness and better competitiveness; flexible decision making (free investment and personnel policy); financial independence; and improved customer service.

At the beginning of year 2006 EU Commission opened an investigation procedure in respect of the Tieliikelaitos (now Destia Oy). The Commission wanted to examine whether some of the benefits granted by the Finnish State to this infrastructure service company, at the time of transition from “in-house” to state enterprise, were incompatible with the provisions of Community law applicable in this area and affect trade negatively. (Europa 2006) At the end of 2007 EU Commission concluded its investigation and raised no objections to the aid provided on a transitional basis but requested the Finnish Government to put an end to a number of privileges, namely the non-application of normal bankruptcy and corporate income tax legislation. (Europa 2007) Although Destia Oy is now an incorporated and a fully state-owned company, the notion of EU Commission is seen to be applicable to other state enterprises also. This is why state is now under pressure to change current state enterprises by split or incorporation to the forms approved by the Commission. (Kauppalehti 2008)

One infrastructure company still working as a state enterprise in Finland is Finavia (airports) although it is in the process of being converted to a state-owned company.

2.1.3 State/Municipal owned company (SOC)

State-owned companies operate under Limited-liability Companies Act as normal limited companies. They operate as commercial businesses and do not have societal obligations like the SOEs or MOEs and receive no government or municipal financial support (Kähkönen 1996). SOCs can also be expected to make profit and to provide reasonable return on capital to state or municipality (Jalkanen et al. 1996). Lines of business where SOCs operate are usually regulated, but at the same time markets are open for competition. SOCs can develop their business activities; make decision about their products and pricing; and choose their customers on the basis of market situation. Some SOCs are however regulated, with a special enactment or alike, because they usually have a socially or nationally important role requiring government oversight. (Heikkinen et al. 1996)

State-owned companies decide on investments independently. They can freely acquire financing from the financial markets and the state can support the operation with share capital financing in exchange for dividend yield. In state-owned companies the General Meeting is the highest decision-making body. The company can also have a supervisory board, nominated by the general meeting, which supervise the management board and the chief executive officer on behalf of the owners. The management board is nominated by the supervisory board and accountants are nominated by the general meeting. (Heikkinen et al. 1996) State owns more than 50 % of the state-owned company therefore being the majority owner. State can exercise its power by having majority of votes in general meeting and having its representatives in the management board.

There are number of benefits and justifications for choosing state-owned company instead of civil service department or administration, or state/municipal enterprise. Donovan (2006) emphasises easier access to financing, increased productivity, esprit de corps and clearer responsibility for results. Jalkanen et al. (1996) includes that SOCs have more target-oriented and faster decision making, the number and selection of employees is set according to the current need, pay policy and the system leads to lower costs and more cost effective way of work. According to Willner (1994) SOCs may also affect the income distribution of the citizens and this way reduces poverty and they can be used as a tool for minimising environmental damage.

Finnish state-owned technical network companies are for example Destia Oy (road), Finnair Oyj (air), Fortum Oyj (energy), Suomen Erillisverkot Oy (data), and Kemijoki Oy (water).

3 Reform and Restructuring

After the international trend for nationalisation and strong control of public utilities, which had run into obvious inefficiency, it was realised in the 1970s that public ownership, political control and the absence of competition weakened effective management, innovation and operational efficiency (Taylor 2006). Main problems were lack of dynamism (Jamali 2004) and the fact that usually economic, financial and social objectives superseded commercial objectives causing inefficiency, high production costs and lack of appropriate incentives and performance monitoring (Hemming and Mansoor 1988). According to Newbery (2000) public sector also failed to invest adequately and often had lower rates of savings than private corporations. Public sector also underpriced output leading to low rates of return, lower rates of re-investment, and higher lending than private enterprises. The prevalent opinion in the literature after the 1970s seems to be that it is only rarely arguable to support pure government ownership. In most cases public-private partnerships or private ownership is regarded to be the most beneficial.

This concept led to the introduction of emerging economic theories which suggested that with reform and restructuring of public sector it would be possible to enhance operational and financial efficiency and the quality of infrastructure services. General economic standpoint emphasise introduction of competition, support inclusion of private sector to the provision of infrastructure services and revision and renewal of regulatory frameworks (Taylor 2006). It was realised that technological renewal and capital investments could be reached only through compromises between politically determined objectives of the public sector and the investment priorities of the private sector (Martin 1993). Worldwide infrastructure reform started in the late 1970s when industries started to adopt the tools of reform: regulatory separation, depoliticisation, liberalisation, deregulation, decentralisation, outsourcing and privatisation.

3.1 Infrastructure reform

Liberalisation is at the heart of economic transformation and it is a precondition to establish a well-functioning market economy. It is defined as “a host of policies aimed at increasing competition and replacing centrally administered resource allocation with market allocation, for example freedom of entry, liberalisation of prices, trade and currency”. (Olsson 1999)

Deregulation gained momentum in the 1970s when it was stated that fewer and simpler government regulations will lead to higher level of competitiveness, productivity, efficiency and lower prices. For example in Finland in the mid 1980s it was realised that supply and generation of electricity had become potentially competitive activities and in 1995 the production and supply of electricity became deregulated and competition was introduced. “It was noted that a separation of network activities from generation and supply and the introduction of competition to these potentially competitive parts of the industry might increase the overall efficiency”. (Kopsakangas-Savolainen 2002)

Liberalisation and deregulation may take several different forms. It may be permission for an independent operator to enter the market, the creation of pooled businesses, horizontal separation of incumbent operators or vertical disintegration of state or municipality owned monopolies. Usually liberalisation culminates in the sales of the state owned assets. However, it should be pointed out that liberalisation and deregulation are not just a matter of public versus private ownership. Some countries have just deregulated the industry while others have at the same time privatised the industry. (Kopsakangas-Savolainen 2002)

Decentralisation is the transfer of authority, responsibility and resources from the centre (state government) to lower levels of administration (local governments, or regional entities of the central government). In the 1970s and 1980s the focus was on decentralisation of governmental structures and bureaucracies, in the mid-1980s the concept expanded to political power sharing, democratisation and market liberalisation and the 1990s brought in the incorporation of private sector, privatisation, liquidation of state enterprises and strengthening of local governments. (Cheema and Rondinelli 2007) It was argued that decentralisation could accelerate economic development, increase political accountability, enhance public participation in governance and bring local knowledge to bear on decisions, break bottlenecks in hierarchical bureaucracies, assist public and private sector to improve their decision procedures, increase the financial resources of local governments and provide the flexibility to respond effectively to local needs and demand (Rondinelli 1990).

In the late 1980s arose ‘New public management’-movement which suggested that by applying institutional arrangement and management techniques from the private sector to the public services it would be possible to change the governance of public sector (Lane 2000, Schwartz 2008). This was hoped to lead to more innovative, market and customer oriented, decentralised and focused service provision where government only steers and oversees the operations instead of delivering them directly (Cheema and Rondinelli 2007).

Commercialisation is often seen a result of globalisation, privatisation, corporatisation, availability of new financial instruments, and entrepreneur-friendliness. Commercialisation is the process of introducing market mechanisms and practices to products or services by subjecting them to market discipline. These principles include financial accountability, risk management, contract-based management, performance measurement and benchmarking, and the principle of return on investment. According to Windischhofer (2007), in technical network literature, commercialisation is only rarely studied in the absence of privatisation. (Windischhofer 2007)

Outsourcing saw its rise in the late 1980s, in the beginning of reform of state ownership. It is the transfer of activities to external contractor for a defined period of time (usually long term). State or municipality can procure the service from private entrepreneur, or lease or hand over the production plant/network to private operator, but maintaining the ownership of the service (Jalkanen et al. 1996). Outsourcing usually applies to a complete non-core business activity and it includes the managerial control but also the risks related to the provision of the service. State or municipality is responsible for the availability and quality of the service and therefore it could finance and control the private production of the service if needed (Jalkanen et al. 1996, Hallipelto et al. 1992)

One outsourcing model used in Finland is client-supplier model, where state or municipality procures service from a state-owned or private enterprise or company. In this model the client is responsible to develop the contracting agreements and provide standards in performance measures that reflect the service targets. The supplier executes the tasks as contracted typically to the overall economically advantageous to the client. The client is, therefore, responsible for the external effectiveness, ‘that the right things are done’, while the supplier is responsible of the internal efficiency, that ‘the things are done right’. This model enables market-like relationship between the

client and the supplier and enhances competition between public and private producers. (Hallipelto et al. 1992)

According to research by Burnes and Anastasiadis (2003) and Harland et al. (2005) the main benefits of outsourcing are to enable organisations to focus on core activities, to reduce costs, increase flexibility and free up assets. Major drawbacks are losses in service quality, communication problems, loss of control, and feelings of insecurity in the work force. (Burnes and Anastasiadis 2003, Blumberg 1998) The decision between in-house provision and outsourcing can be made, for example, by assessing the transaction costs related to the service provision. Transaction cost economics (TCE) determine whether products or services are provided in-house or bought by determining which one is the most cost-effective option. (Harland et al. 2005) As a consequence of outsourcing several different public-private partnership models can be introduced.

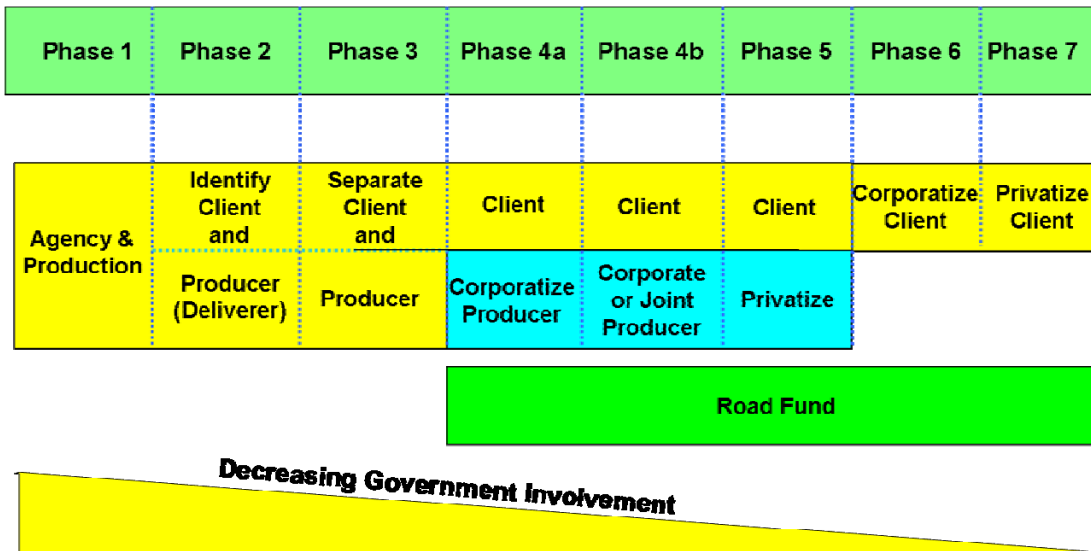
3.2 Restructuring

Figure 4 shows the process from moving from a fully public to fully private ownership. It shows the Finnish process when moving from in-house to state-owned enterprise, to state-owned company, and finally to private ownership. This figure does not dictate whether public or private ownership are recommended or how the process should advance. In fact, other countries do not have this intermediate process and typically changes directly from public ownership to private ownership.

The figure is an example from the road sector and can be applied to other networks. Typically the roads are budgeted and paid for through the government allocation. Other networks, such as water works and electrical supply providers, are self-sustained via expenditures and other fees.

In the case of the road sector, it is mainly budget driven and a sunken cost as there are no direct or ear marked cash flows returning to the local and state managers of the public road budgets. To form these SOE/MOE and SOC/MOC, it was originally designed that there would be some type of a road fund that would collect revenues. This would make the road sector somewhat more self sustaining and some countries such as the USA and New Zealand do in fact collect road users' fees to support the road sector operations. This could be a constant and sometimes increasing source of funding for the expenditure in the road sector and would typically occur during phase 4 or 5 when and if the government decides to follow this process. For example Sonera, Fortum and Finnair are examples of those between phases 4 and 5.

These are very politically sensitive issues and as any direct payment or ear-marked sources are frowned upon by politicians. In Finland this movement began during 1980s Harri Holkeri's Government and it has progressed in recent years (Salminen and Viinamäki 2001). This is part of the philosophy of reducing the size of the government.



Source: World Bank, TNZ & Finnra

Fig. 4. Phases from public to private reform

In the course of time general opinion about ownership has changed and in industrialised countries ownership and control of infrastructure networks has shifted increasingly to private or shared provision. Especially partnerships among the public and private sectors have become more and more popular form of arranging the technical networks' ownership and control. Different mechanisms like contracts and concessions, build-operate-transfer arrangements, and joint ventures are gaining ground to increase the efficiency of service provision and to improve the coverage and quality of the public utilities. These partnerships and private ownership are discussed more thoroughly in the following chapters.

4 Towards private ownership

First privatisations took place in 1979 when the UK government started to sell public sector assets and public enterprises that were small and largely operated in competitive markets (Bishop and Kay 1989). These privatisations were minor in scale compared to those introduced by Prime Minister Margaret Thatcher and the UK government in the mid 1980s when previously nationalised coal, iron, steel, gas, electricity, water, railways, trucking, airlines and telecommunications enterprises were privatised. After this, privatisation has been accepted as a legitimate tool of reform in more than 100 countries.

Privatisation can be broadly defined using the words of Megginson and Netter (2001) as “the deliberate sale by a government of state-owned enterprises (SOEs) or assets to private economic agents”. To be exact, it is the selling of all the assets and the transfer of actual operations and its control, monitoring and finance permanently from the public to the private sector (see e.g. Jonninen 1994, European Commission 2003). Divestiture can be done by selling the assets to a single investor, a group of investors, or possibly through a management buyout or making shares of the firm available for purchase on the stock market (European Commission 2003). Sometimes the word privatisation has been used also in the case of partial inclusion of private sector to the public provision of utilities such as partial sale of public assets, contracting out or franchising (see e.g. Hemming and Mansoor 1988, Ugaz and Waddams Price 2003). In our study this cooperation and contracting is discussed under public-private partnerships in the following chapter.

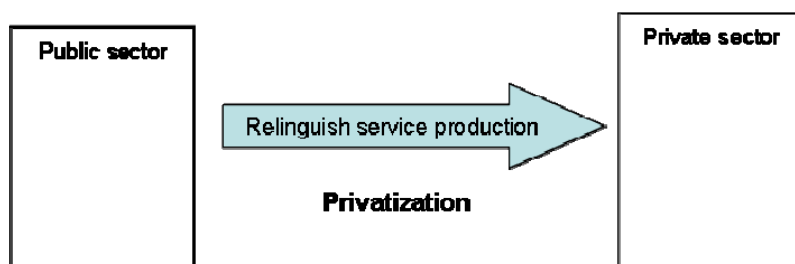


Fig. 5. From public to private provision of goods and services

According to Välilä (2005) privatisation (and contracting out) of public services is economically justified when the quality of the output is easily contractible, improvements in productive efficiency do not negatively influence service quality, and when new technical innovations are important to improve productive efficiency. Perotti (2004) agrees and states that when deterioration of quality from cost reduction is small or contractible and government employees have a weak incentive for innovation, the private ownership is superior to public ownership. According to several studies in Finland, public sentiment favours public sector provision of statutory basic services such as basic education and social security, and prefers privatisation of only supporting services (Jonninen 1994, Hallipelto et al. 1992).

In the US private ownership has dominated electric utilities, for example. Over time, a few large cities have turned to government ownership, but private firms have mostly retained their hold in densely populated urban areas. Today, as in the past, most consumers buy their electricity from large, vertically integrated, privately-owned but regulated service providers. (Jacobson and Tarr 1995)

4.1 Privatisation

When privatisation is enforced, the government has the power to sell the public assets and decide which privatisation method is to be used (described later). When the assets and the control are fully transferred to the private sector, the public agent does not have any direct power to influence the operations. However, public sector can maintain the regulatory role, protecting consumers from monopolistic pricing by setting a price roof or rate of return, and perhaps requiring a minimum maintenance and investment regimen to guarantee the minimum service level (European Commission 2003).

Regulation is in fact very powerful and useful tool for government to control private provision. Regulation is simply a way for a government to impose rules and limitations to the private providers' actions to guarantee safe delivery, quality and quantity of products and return on investment (Taylor 2006). Regulation is important especially when a privatised public service is a natural monopoly (Newbery 2000) or when there is a risk of a formation of private monopoly. In privatisation, one common regulation method is price control and to be exact, a price cap. A price cap is the maximum price that the company can charge from their customers (van den Berg 1997), but government can set the lower limit also (Chen and Subprasom 2007). When privatisation is realised, the public sector should also take care of availability of basic services and that the private owner is willing and able to finance fixed assets and investments so that operations are developed in right pace and service is guaranteed in the long term. Private owner should also have the knowledge to operate in a way that the reliability, quality and competitiveness of service is secured. (Jalkanen et al. 1996)

Privatisation is said to bring several benefits compared to public ownership like efficiency, flexibility and profitability. However, there are some prerequisites which need to be fulfilled to reach the possible advantages and goals of privatisation. First, and maybe the most important, precondition is the existence and promotion of free competition (see e.g. Jonninen 1994, Windischhofer 2007). Competition usually gives firms incentives for efficiency improvement, cost reductions, innovation and possible introduction of new methods of operation. It is often claimed that privatisation in itself creates competition and is the most important benefit of this process but one should note that this is not always the case. Private monopolies may emerge when public utility that is a natural monopoly is privatised, or if there is lack of substitutive goods in the market. This might lead to inefficient and costly delivery of goods and lower level of control. **That is why government has an important task to free the monopolies or to prevent the misuse of them** (Jonninen 1994). It is believed that a public or private monopoly is not sustainable, but a private monopoly is worse than public monopoly. Secondly, the liberalisation of market from political interference, existing incentives and control mechanisms is profitable, so that private firms can function along commercial lines and be financially independent (Hemming and Mansoor 1988). Thirdly, the markets need to work efficiently so that relevant information is available to all stakeholders to provide accountability (Leviäkangas 2007). Fourth, innovation and cost reductions should be encouraged but not with the cost of deterioration in the quality of the service. From the point of view of the client quality monitoring is an important and essential aspect. It is notable, that in the case of socially important commodities it might be necessary to regulate the markets and/or make contracts with the private supplier to ensure the provision of important goods (Shleifer 1998).

Transfer of ownership from public to private sector can be made in several ways. The most common way is probably the sale of a technical network in its entirety to a private buyer. Sale can be executed by selling the shares of the firm or the asset to a private industry/company, by offering shares in the public stock exchange or through management and/or employee buyouts (Hemming and Mansoor 1988, Ugaz and Waddams Price 2003). Management buy-outs and buy-ins were significant elements in transferring ownership and control in the UK in the 1980s (Robbie and Wright 1995). In similar way, a certain activity can be sold if it can be separated from the public utility's core business (outsourcing). Privatisation can also be enforced by handing ownership to the private sector by means of nominal sale or auction. This is appropriate if the firm is e.g. unattractive to a specific buyer or to the wider public because of heavy losses, massive debts or a history of labour troubles. Third method is the liquidation of the enterprise where all the plants and equipment are sold off to the private sector. (Hemming and Mansoor 1988)

4.2 Benefits and challenges of privatisation

The discussion about benefits of private ownership compared to public ownership has been wide and extensive. At the 1980s the private ownership was almost always seen to be the best solution to every service provision and negative aspects were sometimes left unnoticed or they were even ignored. The most often cited benefit of the private provision compared to the public one is improved efficiency. Table 2 summarises also several other benefits associated to privatisation and private ownership.

Table 2. Benefits of privatisation (see e.g. Hallipelto et al. 1992, Jonninen 1994, Shleifer 1998, Hemming and Mansoor 1988, Perotti 1995)

Internal	Improved efficiency Improved flexibility Improved productivity Improved quality of managerial decision making Free and flexible personnel policy Increased market orientation
Financial	Improved profitability Emancipation of financing Access to private financing More effective financial management Increased profit responsibility
External	Possibility to access new markets Development of domestic capital markets Freedom of choice for citizens Improved welfare Promotion of entrepreneurship in municipal level

Robbie and Wright (1995) found an extensive list of problems in buy-ins and buy-outs which could be generalised to other types of privatisation too. According to their study, buy-ins had frequently difficulties in meeting performance targets. This was mostly due to asymmetric information where no adequate or up-to-date information concerning the target company in relation to management accounts, current trading position and the status of major contracts. This and problems in due diligence process caused that new management had to make decision on the basis of at best partial information. Buy-ins also met problems with management coming from outside the firm. Management did not understand the context, circumstances and/or the process (because of asymmetric information) and there were skill gaps, unmatched previous experience and problems in adaptation. Asymmetric information caused also problems in strategy implementation and setting realistic targets for the company. In addition, general macroeconomic conditions put some serious pressure to privatisation process and caused companies difficulties in obtaining credit status and the

needed flexibility to survive in the context of recession. (Robbie and Wright 1995) These some other challenges are listed in Table 3.

Table 3. Challenges to privatisation (see e.g. Robbie and Wright 1995, Salminen and Viinamäki 2001)

Internal	loss of public jobs loss of control cost of developing contracting mechanisms difficulties in implementation challenges in changing people (change management) finding the core roles and competencies difficulties in meeting performance targets asymmetric information
Financial	macroeconomic conditions additional costs from privatisation unsuccessful share issues
External	profit seeking mentality of the private sector having a sustainable private market place imperfect markets opening the market to the private sector mixed results of privatisation

In the current literature privatisation is mostly discussed in the case of developing countries. Western countries have, indeed, gone through the privatisation wave already couple of decades ago. What has not been discussed is the privatisation in western countries in the 21st century. Have disadvantages and problems grown too large? Is there better ways to arrange technical networks and provide public services? Some good alternatives can be found in the following chapter.

5 Procurement

Delivery of infrastructure services and/or products are shifting more toward the private marketplace as the role of governance changes, and in-house forces are being transformed into this new reform toward privatisation. Privatisation often has a negative tone or connotation, but others see this as a goal towards more efficiency and effectiveness. As a consequence of this paradigm change, the public owner or client organisation (hereafter referred to as the client) now need to procure the services or products through the public procurement process and be aligned with any corresponding EU or municipal procurement rules and regulations. If this has not been broadly experienced in the past, this can be a huge learning curve (Pakkala et al. 2007) especially when attempting to procure the services using the best and most innovative contracting methods. For example, during the transition to the client-supplier model by the Finnish Road Administration (Finnra), they had to begin developing procurement methods and writing all of the road characteristics, performance levels, and quality requirements into a legal and binding document (request for Proposal) that the private sector participants could produce offerings. As previously mentioned, it is difficult to place all the requirements and public values into a document that is legally binding, but that is why it requires training, education, time, and expert advice.

Competitive compulsory tendering is required by public sector clients that are part of the client-supplier-model and it even applies to clients that need to meet the local municipal procurement rules. Since the municipal infrastructure sector has many multifaceted needs, the procurement process can be very overwhelming and requires significant administrative resources and knowledge. Some questions that are of relevance include: Can the municipal clients understand, effectively use, and determine the best innovative contracting forms that deliver the services or products? Also, are they able change from the traditional typical hourly wages, fees for service, and unit prices into more modern practices that larger infrastructure clients use? These, as well as other forms of Public-Private Partnerships (PPPs) described in subsequent sections, might become valid challenges.

Municipalities retaining their own work forces only need to negotiate the price that is within their budgetary limitations. This is sort of a give and take negotiations that can be quite fruitless and artificial, and does not necessarily reflect the market price if it was competed in the market. The private owners are exempt from this as they can use any form of legal negotiations, partnerships, alliances or whatever they desire as long as they meet private sector law, which is very different from public sector law.

5.1 Professional service agreements

Professional services can be done via in-house forces or purchased from private sector consulting organisations. In the client-supplier-model these are usually procured from the private sector. These consulting services can be for feasibility studies, pre-design and planning, general or specialised designs, construction-ready design, quality control, inspection and as client advisors. These services

are not discussed in great detail because there are many sources describing these professional service agreements (see e.g. Pakkala et al 2007). Figure 6 shows that these services can be procured individually or in more integrated and comprehensive agreements.

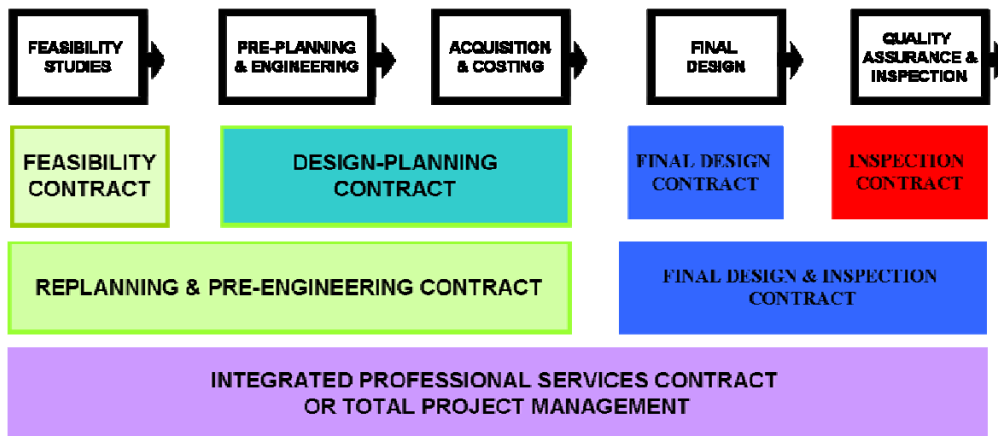


Fig. 6. Professional service agreements

5.2 Procurement of construction

When the technical infrastructure becomes aged or needs rehabilitation beyond its useful life cycle, it typically needs to be rehabilitated, refurbished, or totally replaced with a newer and modern infrastructure. Usually this requires significant capital expenditures. Traditional construction projects include a design phase and the actual construction phase. The more innovative procurement delivery methods also include operations, maintenance, and even private finance.

The typical project delivery models available to be used are as follows:

- Design-Bid-Build (D-B-B)
- Design-Build (DB)
- Construction Management (CM At-Fee)
- Construction Management (CM At-Risk)
- Design-Build-Operate (DBO) or Design-Build-Operate-Maintain (DBOM)
- Design-Build-Finance-Operate (DBFO)
- Build Operate Transfer (BOT) & Build Own Operate Transfer (BOOT)
- Early Contractor Involvement (ECI)
- Alliance model

These are graphically depicted in Figure 7.

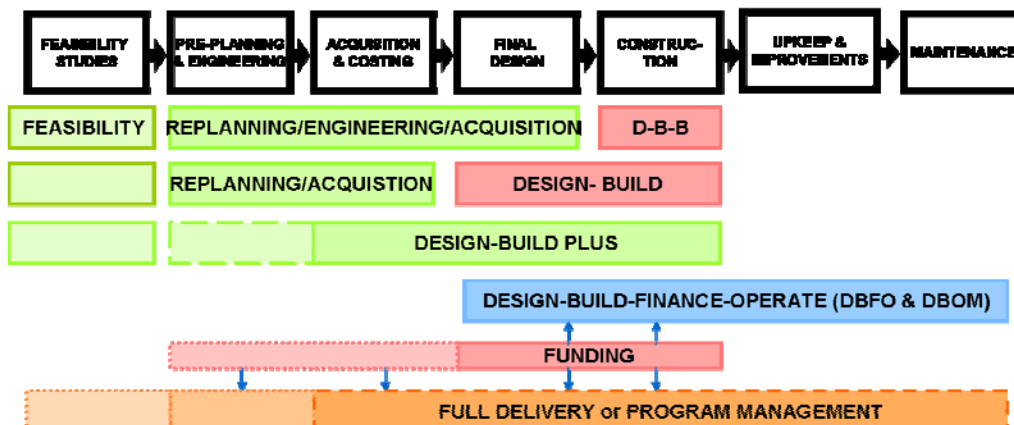


Fig. 7. Typical construction project delivery models (Finnra 2003)

The BOT and BOOT methods are similar to the phases in DBFO, but include changes in ownership and management of the operations. These are some of the privately financed version of the PPPs that include longer term duration and are discussed in more detail in the subsequent sections. Most procurement methods are shown in Figure 8 according to two parameters, direct and indirect funding versus segmented or integrated approach.

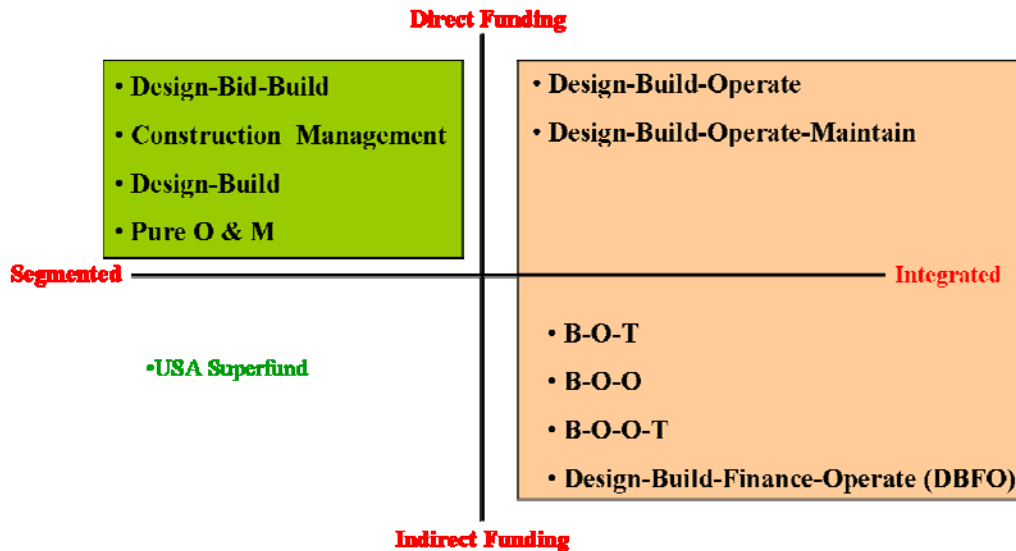


Fig. 8. Delivery system choices (Miller et al. 2000)

5.3 Procurement of routine and periodic maintenance

Often the infrastructure requires attention and maintenance in order to keep the assets from depreciating and to provide essential services for the various types of technical infrastructures. For example, the municipal streets require routine winter maintenance, summer maintenance, and some times require upkeep and minor rehabilitation. Often, these are done by internal work forces (even in USA), outsourced according to each type of activity, or competitively tendered for integrated services for a longer duration. As an example Finnra, typically tenders a combination of winter and summer routine road maintenance services even for a duration of seven years. For the municipalities this may be a challenge and may need to start a deliberate process because these services are procured traditionally using either hourly or unit prices and for a short term or season.

One main pre-requisite is that there needs to be a healthy market or that there needs to be an opening of the market. Water works and rail networks are typically monopolies and very difficult for private sector actors to penetrate the market because of the high risks and costs. The same philosophy applies to the other networks as well and that the markets need to be opened and is a vital part for the success of this reform.

As with construction projects there is a need to have good contracts and the ability to transform public values into the tendering documents. According to (Miller 2000) there are certain fundamental elements for the public infrastructure procurement which are presented in Table 4. This clearly states that a healthy market that has head to head competition, transparency in procurement of public tendering, the client defines the scope of services or products, safety is secured, sound financial analysis, openness to technologic options, and having a portfolio of procurement methods

that can be applied to the correct network application. These are also applicable to construction projects and these should be included into the common practices.

Table 4. Fundamental elements for public infrastructure procurement (Miller 2000)

<ol style="list-style-type: none">1. CLIENT-defined scope.2. Head-to-head competition among PRODUCERS.3. Fair treatment of actual competitors.4. Transparency - Signaling fair treatment to potential competitors.5. Safety confirmed - An independent engineering check on the efficacy of the PRODUCER'S design.6. Competitions open to technological change.7. Sound financial analysis by CLIENTS and PRODUCERS over the project life cycle.8. Re-establishing the dual track procurement strategy of Quadrants IV, 1, and II. (This refers to using a proper mix of DB, D-B-B, DBOM, DBFO & BOOT models)9. CLIENT decision-making at the portfolio level with the assistance of scenarios10. Re-establishing pace (or level) of infrastructure investment as a variable in public and private sectors)
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Some of the more modern maintenance practices can be described as follows:

- Opening the market to maintenance has been key issue and a deliberate process of development should be considered before advancing straight towards the advanced models
- Longer-term agreements
- Integrating services and products
- Lump Sum or Hybrid type contracts (Combination of Lump Sum and Unit Price)
 - Partnering and trust are still relevant (both Client & Contractors)
 - Using quality-based contractor selection criteria

The above mentioned practices are significant challenges for the municipalities and the same question arises: Can municipal clients integrate the more advanced maintenance procurement practices as opposed to traditional practices?

6 Partnerships

A PPP is a partnership between the public sector and the private sector for the purpose of delivering a project or a service traditionally provided by the public sector.

(European Commission 2003)

Public-private partnerships (PPPs) were more or less developed in Europe during the 1990s when new economic theories implied that public ownership was too inflexible and bureaucratic to provide infrastructure services efficiently and cost-effectively enough. Also the problems faced in the era of privatisation in the 1980s became clearer. It was realised that by including the private sector into the provision of technical networks the management and operation of the services could be significantly improved and private capital could be accessed while the public sector still had the power to assure the provision of socially important commodities (European Commission 2003). Public sector could also accelerate the implementation of high priority projects and enable new technologies developed by private entities. Through partnership the private sector could also take part on the risks thus facilitating the burden previously borne solely by the public sector and public partner could reward private partners for mitigating the risk factor by including incentives in PPP contracts (FHWA 2008).

PPP is the relationship between public and private actor where the both parties are working towards a common goal with clearly assigned responsibilities and competence areas in the pursuit of a common endeavour (see e.g. Jamali 2004). Some PPP arrangements are tailor-made collaborations where the governance, management, contributions, risks sharing and operational roles are shared between the parties (Jamali 2004). The governance, contributions and different roles are set according to the objectives of both parties and they vary significantly between different PPP models, which are presented later. Both parties also accept and commit to the risks related to the collaboration and share them according to the predefined distribution of revenues and costs and who is best able to control each risk (European Commission 2003, Nijkamp et al. 2002).

In long-term PPPs the responsibilities and roles can be divided for example in a way that the private sector contractor becomes a long-term provider of the service by designing, building, operating and financing services needed by the public sector. This means that the public sector can shift its operation from direct management and delivery of services to the service planning, performance monitoring, contract management and regulatory activities. The share of the management and investment decision responsibilities depend on the division of assets and the sharing of costs. (European Commission 2003) On the other hand, according to Jacobson and Tarr (1995) many technical networks around the world are owned and operated by governments but built by private firms. The different roles and objectives of each party in partnerships are recognised and listed in Table 5. In addition to the traditional public and formal private sector, the table includes also two other groups which sometimes are involved in the cooperation and can have a role in the service provision.

Table 5. Roles and objectives of different parties involved in public-private partnerships (European Commission 2003, Gidman et al. 1995, Ruokangas 1997)

	Public sector	Formal private sector	Informal private sector	NGOs and CBOs
Role	<ul style="list-style-type: none"> - protect the rights, safety and security of the citizens - provide services for the common good - provide a service or facility which cannot be provided in any other way 	<ul style="list-style-type: none"> - provide additional capital - provide alternative management and implementation skills - provide value added to the consumer and the public at large - provide better identification of needs and optimal use of resources - provide innovative technical and financial solutions 	<ul style="list-style-type: none"> - source of income, employment, and service for the poor in urban areas 	<ul style="list-style-type: none"> - catalyst and facilitator of communities infrastructure development - raise awareness - have a role in decision making, implementation, operations and maintenance of the infrastructure facilities
Objectives	<ul style="list-style-type: none"> - development of communities' technical networks 	<ul style="list-style-type: none"> - financial profit 	<ul style="list-style-type: none"> - service at affordable cost 	<ul style="list-style-type: none"> - development of a public good

Whichever the collaborative parties are, the main reason for partnering is to leverage the strengths of each party. In traditional PPPs the private sector is more competitive and efficient in economic terms and the public sector more responsible and accountable to society (Jamali 2004). Working together they can provide quality services more flexibly, faster and cost efficiently (Nijkamp et al. 2002).

One important benefit in PPPs is the variety of revenue and funding sources which can be used to reduce public budget constraints. These include for example shareholder equity, grant anticipation and general obligation bonds, state infrastructure bank loans, direct user charges (tolls and transit fares) and other revenue streams such as leases or shadow tolls. (FHWA 2008)

Private sector is especially interested in projects which demonstrate sufficient demand, revenue generating and development potential, strong viability and political commitment and meet internal development criteria. The decision if PPP is the best method can be decided by assessing the value for money and added value compared to traditional public provision. (These questions and answers are covered more thoroughly in European Commission's Guidelines 2003 and in OECD/ITF 2007)

As in privatisations, also in PPPs government regulation is needed. Regulations and their effects have been studied widely and researches provide empirical evidence how regulation affects public-private partnerships and especially their profit, social welfare and inequality. The methods for regulations include: price control; outcome constraints such as consumer surplus, revenue and equity; and also capacity and quantity limits. (Chen and Subprasom 2007, Subprasom and Chen 2007) Also environmental regulations are common (van den Berg 1997).

Public-private partnerships have been used around the world for example in urban transit and in water and energy sectors. In the UK, Europe, and (less) in the US urban transit has been provided by private firms under a range of franchise, contracting, and regulatory arrangements. In France private companies operate and manage the bulk systems of waterworks under an array of contracting and leasing arrangements while the government owns the facilities. (Jacobson and Tarr 1995)

Before any public-private partnership is established few critical questions should be answered. What are the potential obstacles and constraints for PPPs? Would the private sector be interested? Is

PPP the best method to deliver the requested service/infrastructure? Potential obstacles and constraints may be related to government policies, legislative authorities, legal framework, taxation framework, and funding. According to OECD/ITF (2007) some key conclusions regarding the legal framework and some prerequisites for PPP are described as the following:

1. PPPs require a solid legal and regulatory framework to protect the interests of all partners – public and private – including by ensuring that public policy objectives and contract provisions are met, and by providing a stable business environment.
2. This does not imply a need for interventionist government policy. However, legislation must enable the existence of infrastructure-providing entities, allow for the transfer of public assets, establish the responsibilities of different partners, outline corporate governance standards, consider any specific required provisions, and establish the terms of tendering and contracting processes.
3. Legal frameworks will differ from country to country, based on existing legal traditions.
4. For the most part, PPP legislation should facilitate investments by reducing risk due to uncertainty, reducing transactions costs, providing for appropriate regulatory controls, and allowing for conflict resolution. It can also establish the principal elements of good governance that must be taken into consideration in establishing arrangements.
5. Laws often dictate how risks may be transferred, and whether this risk transfer allows for investments to be considered as being off a country's balance sheet.
6. They may also dictate such issues as the tolls that can be charged, the extent of cross-subsidization allowed, and other details regarding the overall structure of investment projects.
7. Governments need to develop the appropriate expertise to manage financing processes, including negotiation with, and oversight of independent infrastructure providers. Creating a single infrastructure financing or PPP unit for all of government, as opposed to developing such expertise in each ministry, can reduce duplication and allow for greater coherence.

The creation and oversight of new legislative and regulatory arrangements also involves costs, which should be factored into overall considerations of the relative efficiency of different models for the provision of inland transport infrastructure

It is important to realise that there are many PPP models and variants when applying the above mentioned European Commission definition. Some models transfer limited risks and rewards, while other models provide the opportunity for efficiency, risk transfer, and speed of delivery. It is also a prerequisite that these models have been tested and that the owner/client knows which models are best applied for any given project. For example, outsourcing a single maintenance activity can be considered a form a PPP, but it is basically procuring services that was previously performed in-house and does not necessarily lead to efficiency or effectiveness. The more advanced PPP models do provide these opportunities providing the model is used correctly and applied to the correct type of project (Pakkala et al 2007). Table 6 shows different forms of PPPs.

Table 6. Different forms of PPPs

	Owner	Administrator	Manager	Supplier	Financier	Commercial risk	Contract period	Other
Public	Public	Public	Public	Public	Public	Public	-	
Passive private investment	Public	Public	Public	Public	Shared	Public	-	
Leasing contract	Public	Public	Public	Private	Private	Shared	5-15 years	
Service contract	Public	Public	Public	Private	Public	Public	2month-5 years	
Management contract	Public	Public	Private	Private	Public*	Public	2month-5 years	Fixed fee payments
Joint ventures	Shared	Shared	Private*	Private*	Shared	Shared		
DBFO / Concession	Public	Public	Private	Private	Private,public, shared**	Private	5-30 years	Private finance, public funding
BOT / BOOT	Private to Public	Private to Public	Private	Private	Public or private**	Private	5-30 years	
BOO	Private	Private	Private	Private	Private**	Private	20-40 years	Private finance, private funding
Passive public investment	Private	Private	Private	Private	Shared**	Private	-	
Franchising	Private*	Private*	Private	Private	Private**	Private	5-20 years	Monthly fee
Private	Private	Private	Private	Private	Private	Private	-	

*usually

**financing also from customers (user fees, tolls etc.)

6.1 Cooperation methods

6.1.1 Contracting

Literature presents three different forms of contracts. These are named service, management and leasing contracts.

In *service contracts* private firm provides a specific service for a beforehand specified time (Rondinelli 2003). The contract may pertain to the procurement, operation or maintenance of the service or a product while management and investment responsibilities remain strictly with the public sector. Main benefits of service contracts are the technical expertise gained from private sector, better management of employment issues and potential cost savings. (European Commission 2003, Rondinelli 2003) Examples of these kinds of contracts might be street repairs, bus operation or water and wastewater treatment (Rondinelli 2003).

Management contracts transfers the operation, maintenance and management of a service or a product to the private sector for a specified time (usually longer than service contract). Government maintains its ownership control and is responsible for investment decisions. Contractors are often paid either on a fixed fee basis or on an incentive basis where they receive premiums for meeting specified service levels or performance target. (Rondinelli 2003, European Commission 2003) Main benefits of management contracts are: potential for greater private sector involvement in the future; trust generation between public and private sector; private companies can test potentially risky markets with limited risk exposure; service quality improvements; and encouragement of enhanced

efficiencies and technological sophistication (European Commission 2003). Examples of management contracts can be found in electricity sector and water and transport systems (Rondinelli 2003).

In *leasing contracts* private firms operate and maintain publicly owned assets and pay fixed lease payment to acquire the income streams from them. Public sector owner has the responsibility for planning and financing the overall investment and network expansions but commercial risk is transferred to the private sector partner. Leasing contracts are especially suitable for infrastructure systems that generate independent revenue streams (European Commission 2003) such as electricity and water supply and railway (Rondinelli 2003).

Potential benefits of contracting include the generation of lease payments, management fees and service concessions that can be used to fund necessary improvements; reductions in on going public sector operation, maintenance and capital improvement costs; and potential capture of private sector operational and maintenance efficiencies. Contracting also allows the government to maintain the ownership and control over public facilities and services. (Rondinelli 2003, FHWA 2008)

6.1.2 Joint ventures

In joint ventures the public and the private sector assume co-responsibility for the delivery of infrastructure services. Direction is in both public and private hands and they both provide resources for the project. All the risks, revenues and losses are shared between public and private sector. (Bult-Spiering and Dewulf 2006)

Often private sector has overall control of the service and in many cases public sector just secures the wider social benefit through obtaining services from private sector when it cannot provide them itself. The public sector can, however, continue to play a role at the corporate governance and day-to-day management levels and the government's contribution can also take a form of initial planning regulations, concessionary loan, equity, grant subsidies, transfer of existing assets, associated works or some combination of these. (Bult-Spiering and Dewulf 2006, Allen 2001) The main requirements for joint venture projects are (Allen 2001):

- private sector partners in a joint venture should be chosen through competition;
- control of the joint venture should rest with the private sector;
- Government's contribution should be clearly defined and limited. After taking this into account, costs will need to be recouped from users or customers;
- allocation of risk and reward will need to be clearly defined and agreed in advance.

Joint ventures are used for example in container shipping port and telecommunications in Shanghai and in water and wastewater facilities in the UK (Rondinelli 2003).

6.1.3 PFI and Design-Build-Finance variants

The private finance initiative (PFI) is a form of PPP where the public sector contracts-out the public service to take advantage of private sector management skills incentivised by having private finance at risk. In PFI the public sector partner takes on the responsibility for providing a public service, including maintaining, enhancing or constructing necessary infrastructure. Private sector also arranges finance for the project which distinguishes it from other PPPs. PFI does not necessarily equal privatisation because the public sector usually retains a substantial role either as the main purchaser of service or as an enabler of the project. (Allen 2001)

PFI is widely used in the UK (UK terminology) and schemes are typically financed with 90% debt and 10% equity provided by the private sector. Bank finance is most common for smaller projects

and for larger projects bonds are also used. (Spackman 2002) Public sector can also supplement financing by grants in the form of money or contributions in kind (FHWA 2008). According to the guiding principles of PFI, private finance could be introduced only when it offers cost effectiveness, provide genuine risk transfer to the private sector and secure the value for money in the use of the public resources. (Allen 2001). In the UK there is a process referred as the Gateway system, which streamlines the PPP process and makes certain that each project is viable and establishes a business case. The business case is necessary if private finance is involved and a business case needs to be determined if the project is viable.

The literature is not fully coherent when different PFI models are discussed. Often PFI is introduced as an independent model, but it is also used as a base for other models. In the United Kingdom the term Design-Build-Finance-Operate (DBFO) is used, elsewhere in Europe Concession model is more familiar term. Holland refers to the PFI model as Design-Build-Finance-Maintain (DBFM), which is similar if not the same as DBFO model. There are also three other models namely Build-Operate-Transfer (BOT), Build-Operate-Own (BOO) and Build-Own-Operate-Transfer (BOOT). The main difference between DBFO/concession and other models is that the former is privately financed and publicly funded whereas the latter are privately financed and funded and ownership is with the private sector for the designated period. (Shaoul et al. 2006)

In DBFO and concession models the private investor or contractor design and construct a facility and operate and maintain it for a certain time (FHWA 2008). After the contract period the contract might be renewed at the option of the government or responsibility is transferred from the concessionaire to a government agency (Levy 1996). In these models usually disparate functions such as design, construction and maintenance are combined under a single operator thereby clarifying partnership, contracting and risk sharing. In both DBFO and concession models the public sector is the owner of the assets.

DBFO have been used in the United Kingdom to introduce private sector to extend or enhance and to operate and maintain roads. There are different revenue sources for these kinds of projects such as direct user fees, lease payments, shadow tolls and availability payments (FHWA 2008). Shadow tolls are government payments and the road users do not pay directly for the usage of the utility (Shaoul et al. 2006). These payments can be based for example on the number of vehicles travelled in a series of bands which also provide a min and max to capture the risks. Government sees these shadow tolls also as an opportunity to later consider and introduce a direct user payment system where road users pay direct tolls to the government. The earlier DBFOs contract period was for fifteen years and now usually DBFO's contract period is 30 years or longer so that investors can get return on their equity if debt finance is used. (Shaoul et al. 2006)

Concession agreements are similar to DBFO in that they allow for the concessionaire to design, build, finance and operate a service, with the right to receive revenues from operations and/or to collect the associated revenues for a specified period of time (European Commission 2003, Cox et al. 2002). Definition of a concession contract according to Prud'Homme (2000) is:

The concessionaire carries out all of the capital investment, operates the resulting service and is remunerated through service fees paid by users. The facilities are to be handed over to the oversight public authority at the end of the contract period.

Concession structures can vary from fully private to quasi-public and fully public entities, with varying requirements for private-sector equity. In France for example, most of the concessionaires are limited liability companies owned by central and regional government bodies. (Cox et al. 2002) In concession model the public sector is responsible for making the payments to the concessionaire and financing infrastructure improvements. (European Commission 2003)

In BOT and BOOT agreements private investor design, finance, construct, operate and maintain a facility for public use for an agreed-upon time. During this time the private investment consortium is able to collect revenue from the users to recoup their investment and turn a profit on the investment. When this limited term of ownership expires the ownership is transferred to public sector at no cost. (Levy 1996, Walker et al. 1994) In BOT projects 10-30 % of the financing is equity financing from private sector sponsors and the rest is usually financed with debt. In some occasions the government may furnish for example a portion of the land required for the project or possibly grant partial tax reliefs of some kind. (Levy 1996) Build-Own-Operate (BOO) models differs from BOT and BOOT in that the private sector owns the facility and the ownership remains in the hands of the private operator even after the expiration of the contract period. BOO(T) models can thus be considered as partial privatisation. (Koppinen and Lahdenperä 2004) In all of these models the contracted parties must acknowledge that risks should be assumed by the party that is best able to control, influence and manage them and that is why it is important to recognise and provide mechanism for the assignment and management of those risks. (Walker et al. 1995)

There are various opinions about the possible benefits of these PFI projects. Advocates emphasise that PFIs help government to fast-track much-needed infrastructure work, get financing for projects that otherwise might not be built and help firms to meet project cost and schedule targets. Maybe the most important benefit (if objectives are met) is the risk transfer away from the government onto a single responsible party. (Nielsen 1997) Opponents criticise that private finance is too expensive for these kinds of projects, risk transfer is usually more difficult to execute than expected and value for money might be smaller than anticipated (Shaoul et al. 2006). Pakkala et al. (2007) explains that: “often the argument is raised that in some countries where the credit-worthiness of the state is very high (for instance, Finland which has a triple A rating), interest rates for the Ministry of Finance for loans at the capital market are lower than for private construction firms or consortiums. This argument is flawed to the extent that the state can be a reliable lender since it always has the opportunity to pass on risks and higher costs to the tax-payer”. One reason to establish a so called “public sector comparator” is to make sure that the PPP variant is more favourable and beneficial than any other variants or models.

Figure 10 shows the stages of progression from one model to another. Usually the progression and moving to a next level requires some form of development, research, studies and experience. It is difficult and not recommended to move directly from traditional Design-Bid-Build model to advanced PPP models such as DBFO. Intermediate phases can be considered as a learning process and any valuable experience learned from those models will make adaptation quicker and more beneficial. (Pakkala et al. 2007)

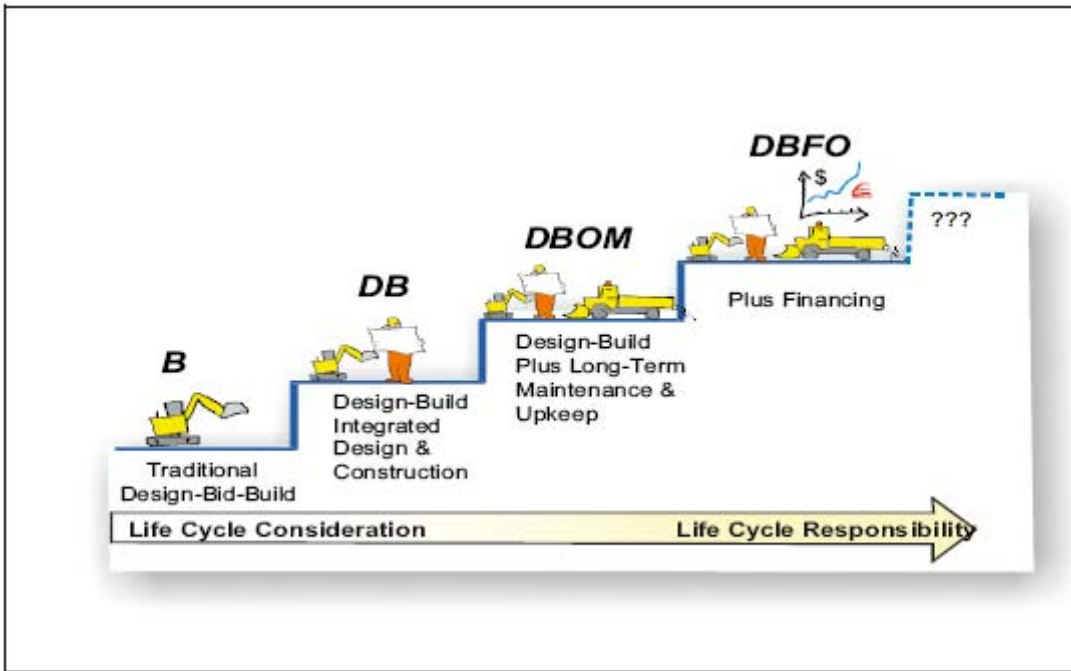


Fig. 9. Project delivery progression (Finnra 2003)

6.1.4 Franchising

Franchising is an arrangement between two companies where franchiser gives their business idea which has been tested in practice and found workable. The franchiser hands over the franchisee the right to use the business concept against some agreed on royalty. The rights and responsibilities, rules and ending of the partnership are always defined in writing. The franchisee commits to follow the agreement and directives, guidelines and quality requirements set by the franchiser while it monitors and controls the operation. The Franchiser does not usually finance or own shares of franchised company. (Fielding and Klein 1993, Knowles 2004, Spinelli et al. 2004) Literature concerning franchising of communities' technical networks is quite narrow. Most often franchising has been used in transport networks such as roads and rail service.

In California franchising has been used in private toll roads where state handed private party the right to propose, design, assemble, create, construct and operate a facility for a defined period while the state held the ownership of the assets. The contract between the state and the franchisee specified the basic service options, mandate state design, the construction standard and base rate-of-return ceilings. Government set also quality and performance standards for the service. All costs were to be remunerated by toll revenues. Because highway investments are long-lasting, long-term agreements (about 35 years) were seen appropriate. (Fielding and Klein 1993) In California the franchising model resembles very much the concession model and design-build variants described above.

In the UK franchising has been seen as one way of privatisation. Britain privatised railways in 1996-7 by arranging competitive bidding for franchises of passenger rail services instead of on-track competition. This was because they believed to achieve this way more efficient rail services and lower subsidy bill. The rail franchise contract usually lasts 5 to 15 years, normally about seven years. (Knowles 2004)

6.1.5 Other approaches

Passive private and passive public investments are examples of other infrequently used approaches.

Passive private investment makes private investment available to government-run operations. (Bult-Spiering and Dewulf 2006) Especially in developing countries private investments seem to have a larger positive impact on long-run growth than public investment. That is why government should support and aim at creating conditions attractive to private investment by establishing stable macroeconomic environment and provide adequate legal and institutional arrangements for the protection of private property. (Khan and Reinhart 1990, Khan and Kumar 1997)

Passive public investment gives government funds to private operator through grants, equity investments, loans or guarantees. Objective is to induce private sector organisations to participate in offering infrastructure services that contribute to economic development. Government can give private operator guarantees or fiscal incentives, or provide individuals or groups loans or subsidies so that they can purchase services from the private sector. The provision of guarantees and incentives may ultimately be less costly for the government than direct provision of services and in addition they give private sector opportunity to increase the potential for profits that would seem too risky or unprofitable. (Rondinelli 2003) Public investment in infrastructure can also increase the productivity of private capital and, especially in developing countries, be beneficial for growth. One should, however, note that some public investments can also have less positive, or even negative, effect on growth. (Khan and Kumar 1997)

6.2 Selecting an appropriate PPP method

European Commission (2003) has prepared an extensive list of things which should at least be considered when selecting an appropriate PPP method. First, the service needs and objectives of the PPP should be assessed and risk allocation done. Second, project phases (e.g. project design, procurement and construction, financing, ownership, operation and maintenance, marketing) to be included in the PPP should be decided. Third, a detailed review of costs and benefits of private sector involvement compared to public alternative should be done. Decision makers should also ensure that a PPP enhances public benefit. Fourth, the degree of private involvement needs to be carefully matched to the objectives and needs of the project and the public. Also the appropriateness, cost, risks and the ability to effectively implement and manage the project should be assessed. (European Commission 2003)

Nijkamp et al. (2002) distinguish different models on the basis of the division of competence, the degree of risk-sharing and financing. They also include some other external and internal factors in the analysis, such as

1. Institutional arrangement

- Type of initiative (mainly public with limited number of players; mainly private or public-private with large number of players)
- Type of actors' co-operation (traditional; joint venture; concession)
- Spatial scope (local; regional; (inter)national)

2. Financing and risk

- Financiers and risk-bearers (mainly public; mainly private; joint public-private activity)
- Awareness of different risk profiles of project parts

3. Contractual arrangements

- Transparency of profit(ability) requirements
- Nature of contract (global; detailed)

4. *Revenues and costs*
 - Financial transparency
 - [Soil pollution costs]
 - [Expected rise in land price]
5. *Project organisation*
 - Selection procedure of partners (open selection; target group approach; combination)
 - Stepwise approach to project components

6.3 PPP's advantages

Following Table 7 presents advantages of public-private partnerships presented in the literature.

Table 7. Advantages of public-private partnerships (Rondinelli 2003, Cheema and Rondinelli 2007, European Commission 2003, Ruokangas 1997, Edwards and Shaoul 2003, Gidman et al. 1995, FHWA 2008, Jamali 2004, Nijkamp et al. 2002, Spackman 2002, Namblard 2000)

Internal	increased capacity to extend services higher level of productivity optimal overall risk and cost allocation between public and private sectors increased efficiency in service provision and supply chain management possibility to experiment with new technology and procedures service extension without increasing the number of public employees and without large capital investments reduced burden on strained public resources better incentives to perform enhanced public management and better management techniques from private sector waste elimination develop stronger capacity to maintain infrastructure collective problem solving
Financial	easing of budgetary constraints realistic evaluation and control of costs cost efficiency and cost savings access to private finance improved financial situation reduction of transaction costs reduced life cycle cost generation of additional revenues increase national productivity and economic output optimising project impact while raising profitability for a given level of investment
External	streamlined construction schedule and reliable project implementation project stability better service quality expanded coverage greater choice of services reduced service costs government can assure continuity of service increase competition advantage of economies of scale more flexible respond to market signals more easily to procure modern technology subject to commercial discipline and sound financial due diligence flexibility and speed faster implementation increased employment and income political independence accountability more effective articulation of demand modernisation of the economy a new role for the public authority

6.4 Challenges and risks realised in PPPs

Partnership is not always possible or practical and if pursued rarely not even easy. Successful partnerships need keen competition, clever contractual design, trust, flexibility, policies (→ sustainable governance arrangements), powerful partnership boards and clear lines of communication and regular consultation of stakeholders (Kelly 2000). In Table 8 some problems faced in the realisation of PPPs are listed.

Table 8. Challenges faced in realisation of PPPs (see e.g. Nijkamp et al. 2002, Kelly 2000, Grossman and Hart 1986)

Challenges caused by partners	Incomplete contracts Lack of clarity on desired outcomes Lack of sharp incentives Managers cannot deliver the desired outcomes Holdup problem caused by a change in the position of partners or interpretation of contract clauses or requirements Slow decision-making Cultural differences between private and public partners
Challenges caused by the projects	Long planning-horizon Complexity of various projects Uncertainty in respect of timely and transparent mapping of all costs, revenues and profitability
Challenges caused by externalities	Lack of competition Lack of linking payment Guidelines formulated by institutional actors, e.g. the role of public subsidies and the competition rules for public projects Recent financial crisis Timing during financial rates Commitment to a long-term debt Inability to include retirement funds from own country or other national sources. Controversy of public against PPP The finance ministry can be against PPP when looking purely at overall cost

One of the most important obstacles in realisation of public-private partnerships is incomplete contracts that have been widely discussed in the literature. The notion of incomplete contracts is based on the fact that it is extremely difficult and costly to write long term contract, where all the payments and actions of all parties in every possibly situation are unambiguously specified. (Grossman and Hart 1986, Hart and Moore 1990) This is why contracts are almost always incomplete and they will be subject to renegotiation and change (Hart and Moore 1990). Incomplete contracts can yield outcomes that are inferior to those that would be achieved with complete contracts (Grossman and Hart 1986)—and vice versa. Hart et al. (1997) write

The assumption of contractual incompleteness is not hard to motivate once it is recognized that the quality of service the government wants often cannot be fully specified. Indeed, critics of privatization often argue that private contractors would cut quality in the process of cutting costs because contracts do not adequately guard against this possibility.

This is why Williamson (1985) emphasises the importance of contracting governance which objective is to organise transaction between parties in such a way that they can be adapted as efficiently as possible.

Although owners might be successful in transferring the ‘original’ risk intended to the private contractor, the contracting is likely to introduce other risks which fall into three categories – organisational, technological and legal/contractual risks. Organisational risks emerge when several parties from different organisations, regions and countries link up with different views of the best management and operation method. On the other hand, risks also arise if the project and project consortium are too small to meet the up-front investments required. Technological risks stems from

the issue of technology transfer and management science if applied incompletely or inappropriately because of lack of funds or know-how. Other risks arise if new products and materials cannot be introduced because for example lack of funds, if there is too much technological information for understanding the core concept of the project or if time savings and cost reductions are taken to the utmost. Legal/contractual risks arise when legal and governmental frameworks and traditional contract forms cannot keep pace with the changing partnership environment and new contract forms need to be introduced. Also the changing insurance, warranties and guarantees used in project case extra risk. (Nielsen 1997) Another alternative in viewing the risks are according the completion, market related and institutional risks. Refer to Figure 10 for these types of risks (Miller and Lessard 2000).

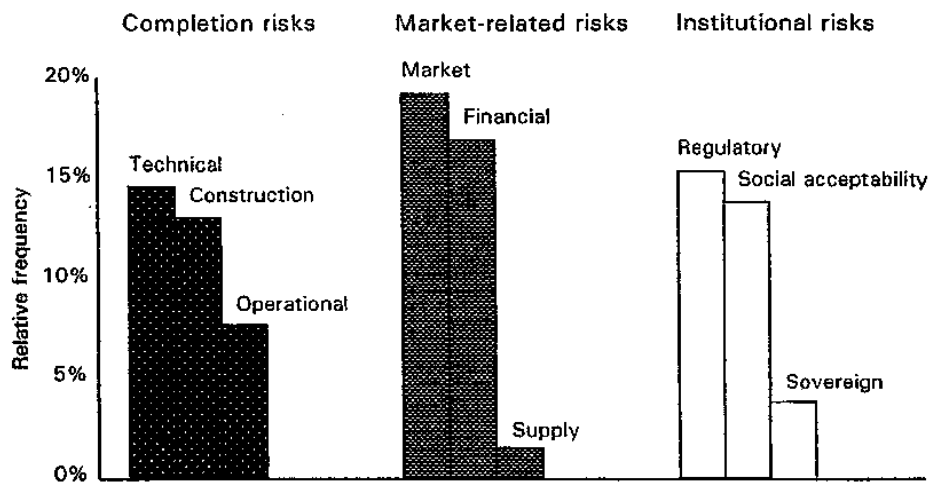


Fig. 10. Various Risks in PPPs (Miller and Lessard 2000)

6.5 Case examples

In Table 9 Finnish technical networks ownership and governance models are presented.

Table 9. Technical networks ownership and governance in Finland

Network or node		Ownership	Governance model
Transport	Public roads	State	Mandated infrastructure administrator and manager; Finnish Road Administration
	Streets and communal roads	Municipality / city	Mandated department of the municipal government
	Rail network	State	Mandated infrastructure administrator; Finnish Rail Administration
	Harbours	Municipality / city	Municipal company or city-owned limited company
	Airports	State	State-owned limited company
Civ.eng./communal	Water & sewage	Municipality / city	Municipal company or city-owned limited company
	Local electricity	Municipality / city or private	Municipal company, city-owned limited company or private limited company
	Local telecommunications	Municipality / city or private	Municipal company, city-owned limited company or private limited company
	Heating	Municipality / city or private	Municipal company, city-owned limited company or private limited company
Civ.eng./national	National electricity gridlines	Private (the state has a minority share)	Private limited company
	Telecommunications	Private (the state has a minority share in some)	Private limited company

Table 10 presents some research observations in relation to change in ownership and governance models. Comments describe if the change has been successful or not and some other related factors. These are only a few examples of realised ownership changes and no solid conclusions can be drawn from these successes and failures.

Table 10. Some examples of different PPP models

		O&G model	Where?	Comments
Transport	Public and communal roads, streets	DBFO	UK (Shaoul et al. 2006)	Lack of public accountability. Cost more than expected. Expensive. Problems in risk sharing. Exploratory and costly option.
		BOT / concession	Tunnels in Hong Kong (Tam 1999)	Very successful.
		BOT / concession	Toll roads in Thailand (Tam 1999)	Problems caused by mistrust between government and private sector, disagreements in toll increments and changing foreign investment policy.
	Rail network	Privatisation	Canada (Laurin & Bozec 2000)	Canada successful. Increased performance.
		DBFO / concession	Kuala Lumpur, Bangkok (Phang 2007)	Partially successful. Lack of knowledge, financial difficulties, lengthy disputes, dept problems, threat of nationalisation.
		Operating concession / privatisation	Argentina (Phang 2007, Ramamurti 1997)	Successful. Long-term contracts preferred. Not a panacea but a palliative that reduces subsidies.
		Franchising	Australia (Mees 2005)	Failed. Over optimistic predictions, no significant improvements in performance, 'moral hazard' problems.
	Harbours	PPP	Pusan Port South Korea (Bagchi and Paik 2001)	Successful cooperation.
		Privatisation	UK (Cullinane and Song 2002)	Benefits are difficult to identify and quantify. Privatisation is only a partial cure for efficiency.
	Airports	Public, Private, PPP	Several countries around the world (Oum et al. 2006)	The results suggest that PPP with minority private sector participation and multi-level governments' ownership should be avoided, supporting the majority private sector ownership and operation of airports.
		Privatisation	Latin America and The Carribean (Brown 2008)	Successful. Privatised firms are operationally and financially more efficient.
Civil engineering	Water & sewage	Privatisation	England & Wales (van den Berg 1997)	Partially successful. Problems e.g. in credibility and price cap regulations.
	Electricity	PPP / Privatisation	Power in Greece (Burnes et al. 2004)	At least short-term success.
	Telecommunications	Privatisation	Netherlands, UK (Hulsink 1998)	Successful.
		Public ownership	France (Hulsink 1998)	Functional.

7 Summary

For centuries, ownership and governance structures have been dependent on time, prevailing economic trends, political will and crisis. Opinions about the best ownership and governance structures have been shaped by contingencies of political and institutional development, by ideas and ideals concerning the role of the state in the economy and characteristics of time, place and circumstance. Also constraints in geographical expansion have been particularly important when private firms have had the possibility to exploit economies of scale opened up by new technologies in ways denied their municipally owned counterparts. (Jacobson and Tarr 1995)

After The World Wars technical networks were forced into the public hands in Europe. In the 1980s the “New Public Management” movement spurred private ownership and in the 1990s partnership were seen as an attractive alternative. Although visions about the preferred ownership structure have changed during the years, the governance models have stayed quite the same. Their significance and importance in decision making have, however, become more important when ownership and control have been separated. Governance is today an important and integral part of public-private partnerships and other ownership structures. Choosing between public or private ownership and governance can be examined through certain factors presented by several researchers around the world. These are briefly considered next.

Hemming and Mansoor (1988) state that when competition is introduced and promoted there is ‘no need’ to hold the company under public ownership. They argue that in the case for competition and private ownership is *probably* increasing economic efficiency more than public ownership, thus making private ownership superior. Hart et al. (1997) agree that competition may strengthen the case for privatisation, but only because the differences between public and private laws are different under privatisation, which creates the fundamental difference between these ownerships. This means that the private sector is less bureaucratic as opposed to public bureaucracy. They, however, want to emphasise that the general view of identifying privatisation with competition is misleading because in principle it is possible to create competition between several state owned companies and it is also possible to have private firm with no competitors (monopoly or cartels).

Grossman and Hart (1986) and Hart and Moore (1990) introduce the second factor, incomplete contracting. As many other researchers after them have found out, it is extremely difficult and costly to make complete contracts which state all the actions and payments unambiguously in every possible situation. This is one of the most important findings and important lesson learned to develop contracts that are fully comprehensive. Hart et al. (1997) even argue that if complete contracts would be possible, public and private provision would be equally good. But because this is impossible one should concentrate on evaluating the adverse consequences of these incomplete contracts. Theoretical arguments by Hart et al. (1997) suggest that public ownership is superior when “non-contractible cost reductions have large deleterious effects on quality, when quality innovations are unimportant, and when corruption in government procurement is a severe problem”. On the other hand private ownership is preferred if deleterious cost reductions or certain level of

quality can be controlled through contracts, when quality innovations are important and when there are severe problems inside the government related to patronage and powerful unions. (Hart et al. 1997) Shleifer (1998) also adds that if there is a possibility for government to set contracts or regulations for private ownership, the difference between in-house provision and contracting disappears.

Rosa (1993) approaches public and private ownership through economic theory. In his model, the rational government compares the expected return of the SOE to its resale value on the equity market that is the value of the SOE to a private investor. The value of the firm for the state is assumed to equal the weighted average of the social cost of taxes and the cost of borrowed funds and for the private sector the interest rate. The model implies that an increase in the tax ratio encourages movement towards privatisation, because if a government is able to increasingly levy taxes the need for SOEs diminishes. On the other hand, if the interest rates are increasing, nationalisation should be preferred because it increases also the cost of capital for the private investors. Similarly, if the social cost of taxes increases, privatisation is preferred because it depresses the firm value more to the state than to private investors. Rosa (1993) states that, in his opinion, the model is in line with the generally proposed causes of privatisation such as 1) a change in the dominant ideology following the breakdown of communism, 2) a reassessment of the performance of state and private firms and 3) and that a moderate variation in interest rates could entail a major policy reversal. (Rosa 1993)

Kelly (2000) considers selection of ownership structure through the nature of the market structure. In his opinion, public sector ownership depends upon the market structure, and is favoured if the industry or service had monopoly or oligopoly features, and the service has characteristics of a public good. Jonninen (1994) adds that if the service is essential for users or it is otherwise socially necessary, full privatisation should not be considered possible.

Heikkinen et al. (1996) states that the difference between ownership models (public, SOE, SOC, private firm) can be seen, when considering how independent they are in making decisions concerning service markets (what is produced, price, societal objectives), production factors (employment conditions, investments), financial markets (independent cashier, shareholders' equity, borrowings, holdings) and bankruptcy. Hallipelto et al. (1992) adds also decision of control to this list. Thus it is about question about governance—who makes the decisions and how the decisions are informed to different stakeholders.

Bös (1991) provides an excellent theoretical discussion on the behaviour of public, private and mixed ownerships. He argues that typical public manager has an incentive to work as effortlessly as possible with fixed salary and in a private firm the manager has an incentive to produce X-efficiently if he is risk-neutral and his income depends on profit. In the case of a private firm there is also a need to cope with allocative inefficiency caused by monopoly pricing with explicit regulation. Which leads Bös (1991) to the conclusion that privatisation seems to be an appropriate choice to improve firms efficiency if subsequently regulated. PPPs provide the superior arrangement of the interaction between government and the firm but at the same time it provides also inferior interaction between the management and the board within the firm. Bös (1991) concludes that which effect is more important cannot generally be determined and neither policy can be excluded ex ante as unreasonable. Boardman and Vining (1989) found that large industrial PPPs and SOEs performed substantially worse than similar private companies and further that PPPs performed no better and often worse than government-owned firms, which may be caused by the conflict between public and private shareholders and the objectives of the venture.

One important factor to consider in choosing suitable ownership model is risk sharing. Long-term risk sharing is one of the most significant differences public-private partnerships. Väilä (2005)

even argues that “whenever either the public or the private sector partner carries all of the risks related to production and supply, there would be no partnership in the current sense of the word”.

In summary, there are various ownership structures and governance methods discussed in this paper. It is more of a description and alternatives for different practises and the municipalities are able to determine the preferred structure they which to incorporate. The different approaches should be analysed and weighted in order to find the best possible solution. It has been observed that one size does not fit all and one needs to carefully make conclusions before undertaking any paradigm change.

The ownership and public sector reform are very political and sensitive issues and some believe it to be a hidden movement towards privatisation and downsizing. In Finland this movement began during 1980s when state-owned enterprises and companies were introduced as part of the government reform. This has progressed in recent years and is part of the philosophy of reducing the size of the government especially when there is a recession or budgetary crisis.

8 Discussion and conclusions

This paper presents a set of models considered to be suitable for arranging technical networks ownership and governance. These models have been discussed widely in the previous literature. Privatisation, public ownership and public-private partnerships have all found their supporter and opponents over the years. The models presented here are, of course, not the only ones but they represent a good variety of models found and used in this field. Some of the models are very similar to each other and some of them are overlapping. There is much experience and information about the subject although the literature is somewhat inconsistent. In many cases, for example, partial sale of public assets, contracting out or franchising has been seen as privatisation but is in fact a form of PPP. Many researchers conclude that with reasonable competition or government regulation private technical networks can in fact be more efficient than their public counterparts. At the same time it is also realised that, although privatisation might be a good option to organise technical networks, it might not be the best option in all cases.

Public ownership is still quite common, especially in developing countries but also in industrialised countries. In the latter, change has, however, increasingly been towards private ownership and some forms of PPPs. If the state has for some reason wanted to hold on to the ownership, civil service departments has the alternative to form SOEs and SOCs. In this way the government could retain its control, but still move towards more a productive and financially efficient operation. In Finland there has also been a tendency to change civil service departments to state enterprises but this era might be soon over. EU Commission has concluded at the end of 2007 that Finnish Government needs to modify the state-owned enterprise structures, namely allow normal bankruptcy and pay corporate taxes (Europa 2007, Kauppalehti 2008). However, the EU decision overlooks the important learning role SOEs have in moving from a government administration to a corporate form, whether fully or partially owned by the state. Another lesson learned is that moving from public to private ownership is very difficult and this intermediate stage of SOEs and SOCs is vitally important. As stated before it is very difficult to write complete and comprehensive contracts especially for municipalities.

The study of PPPs is still quite a new area of research. There has already been a wide discussion about the benefits of PPPs in general, but the debate over the advantages and disadvantages of a particular PPP models have been limited. In addition, only a few researchers have compared different PPP models with each other. All this might be due to the newness of PPPs. UK has probably the most extensive literature on the topic but it is difficult to directly incorporate it to your own country and culture. The success of the partnership and the possible disadvantages can be properly assessed after the contract period has ended, but because PPP contracts often last several decades this is not yet possible. In the near future some of the PPPs are coming to their conclusion and it would be interesting to investigate the findings.

Among PPP models, Design-Build variations have been probably the most common and most researched over the years. These models are, however, originally used in infrastructure projects

where private sector's major contribution has been in the design and construction phases. Although the private sector has also taken part in the operation and maintenance of these networks, fully integrated models such as DBFO, BOT and BOOT are becoming more interesting. These models are seen as a good starting point for PPP implementation. These kinds of partnerships can be very advanced with important and desirable properties in risk sharing, management, operation, environmental considerations and public benefits. However, future research may lead to even newer and more advanced PPP type models.

When looking for a suitable ownership and governance model for a certain technical network and when studying models presented here, one must remember that all the models and their advantages and disadvantages are context specific. These strengths and weaknesses are strongly related to the process and method of implementation. Almost in every case there is, at least, a need to modify and maybe even merge in desirable properties of the different models presented here to obtain, at the end of the process, the most usable way for organising the ownership and governance of a technical network. Each project is quite different and it is not the sole purpose to recommend any one model as a solution for all projects. Each project must be evaluated through due diligence and a thorough investigation of which model is best appropriate.

This work gives a good starting point for further research in the area of ownership, governance and partnerships. Further investigation is forthcoming and includes categorising current technical networks and their ownership and governance models in Finland. These models can then be reflected and compared to theoretical discussion made in this paper. One important area of study concerns the different risk bearing models and especially how different risks are, or could be, divided between parties in PPP models.

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APPENDIX 1

Five roles in public-private partnerships

Owner	Someone who has exclusive rights and control over property. This property may be for example an object, real estate or intellectual property. Owner has a complete legal control over the property.
Administrator	Someone who directs, manages, executes or dispenses civil, judicial, political or ecclesiastical affairs. Administrator can manage a government agency or department.
Manager	Someone who controls resources and expenditures and is responsible for the maintenance, administration and management of the affairs of the company.
Supplier	Manufacturer, processor, packager, distributor or wholesaler who, in the course of business, supplies a particular product or service to its customer.
Financier	Someone (a person, financial institution, government, company) who is engaged in money lending, financing projects or large-scale investing.

APPENDIX 2

Ownership and governance models

Public	Civil-service department: Integral part of state or local government. State/municipal enterprise: State (SOE) or municipality owned (MOE) business unit, for which government or local council has defined the state of (financial) independence. Can autonomously design and operate its business operations and investments but receives financial support from the government or the municipality. State-owned company: State-owned companies (SOC) operate as limited company and as commercial businesses. No societal obligations or financial support from the government.
Passive private investment	Private investment in government-run operation.
Leasing contract	Private firm operate and maintain publicly owned assets and pay fixed lease payments to acquire the income streams from the assets.
Service contract	Private firm provides specific service for a specified period of time.
Management contract	Private sector provides the operation, maintenance and management of a product or service for a specified period of time.
Joint ventures	Public and private sector assume co-responsibility for the delivery of the product or service. All risks, revenues and losses are shared between public and private parties.
DFBO / Concession	Private investor or contractor design and construct a facility and operate and maintain it for a certain time. After the contract period the contract might be renewed or responsibility is transferred from the concessionaire to a government agency.
BOT / BOOT	Private investor design, finance, construct, operate and maintain a facility for an agreed-upon time. After limited term of ownership the ownership is transferred to public sector at no cost.
BOO	Private investor design, finance, construct, operate, maintain and own a facility for an agreed-upon time. The ownership remains in the hands of the private operator even after the expiration of the contract period.
Passive public investment	Grants, equity investments, loans, subsidies, guarantees or fiscal incentives from the government to the private operator.
Franchising	The Franchiser hands over the franchisee the right to use the business concept against some agreed on royalty. The Franchisee commits to follow the agreement and directives, guidelines and quality requirements set by the franchiser.
Private	Private operator has exclusive rights and full control over property.

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